

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

AUGUST • 1958

Hercules

Peerless

Riverside

**American's unique merger—
will it change the course of the cement industry?**

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Why wash aggregates?

Page 74

Quick-Delivery

DENVER

Forced Feed

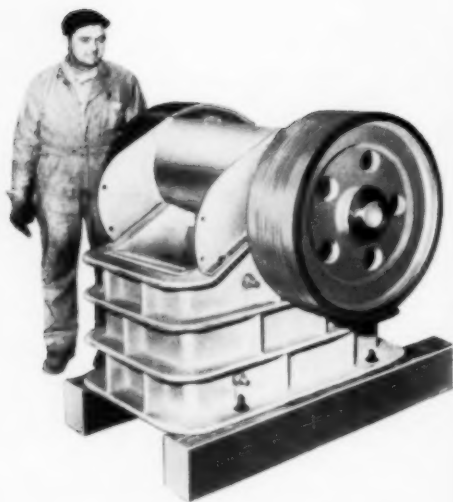
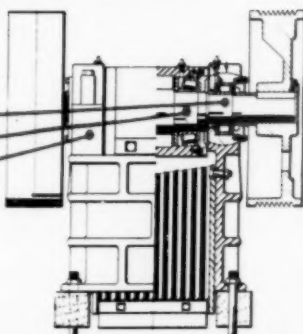
**JAW
CRUSHERS**

In Stock!

Anti-friction
bearings:

Here ●
Here ●
Here ●

in all sizes,
5" x 6" through
10" x 20", Type "H"
DENVER Jaw Crushers



Shipment from stock in sizes
5" x 6", 8" x 10", 10" x 16" and
10" x 20". Other sizes to 36"
x 48" are available.

Dealer Inquiries Invited

To provide the quickest possible delivery, DENVER Equipment Company maintains a complete stock of all sizes from 5" x 6" to 10" x 20" DENVER Forced Feed Jaw Crushers in Colorado Springs, Colo. Also, dealer stocks in many parts of the country.

A telephone call brings action to solve your size reduction problem. Recommendations, specifications, prices on request.

**Now—Roller Bearings Throughout...
for Long Life, Low Maintenance Cost**

- Anti-friction roller bearings in side frame and bumper. Crusher runs smoother, bearings last longer, maintenance costs reduced.
- Side bearings in carrier permits bumper removal without exposing bearings to dirt.
- Side bearings on 10" x 16" and 10" by 20" sizes set in ball and socket type mounting for perfect self-alignment.
- Reinforced cast steel frame ends breakage.
- Manganese steel jaw and cheek plates for extra long service.
- Jaw plates reversible for long service, low maintenance cost.
- Pressure grease lubrication and labyrinth dust seals.



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Complete Mill Equipment



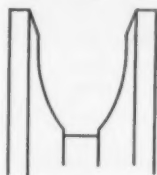
B.F. Goodrich

V belt briefs

TIPS ON THE CARE, MAINTENANCE AND SELECTION OF V BELTS FOR INDUSTRY

Worn sheaves can ruin belts fast

Be sure to check the pulley grooves when putting new belts on a drive. If the sidewall is worn, the sheave should be replaced.



Worn sidewalls dish out (see illustration), form a "shoulder" at bottom of groove which chews off bottom edges of belt, ruins new belts in no time.

Even cast iron or steel sheaves will wear when subjected to abrasive dust. Rust is also an enemy of sheaves. Highly polished sheave sidewalls rust easily, gradually wear away as rust is polished off by belt action.



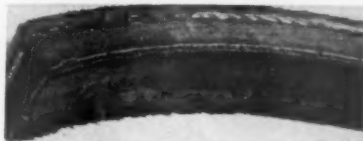
STRONGER MUSCLES FOR AN IRON FIST—That machine, run by V belts, beats clay into fine dust for making bricks. But the heavy load, heat and dust caused belts to fall to pieces in two weeks. Rather than go to the expense of redesigning drive with more belts, they switched to B.F. Goodrich High Capacity V belts. These belts are so strong they've already lasted six months—10 times longer than the other belts—and still look good.

Don't play "snap the whip" with V belts



V belts that sag too much are snapped tight suddenly when the motor starts or when peak loads occur. That snapping action can actually break the belts, because this added stress is more than the belt was designed to take. Keeping belts at correct tension will prevent this "snap the whip" action.

What caused this V belt failure?



Cause: Oil splashed or dripped on belt. Caused swelling, softened rubber.

Prevention: Use splash guards to protect drives. Where oil can't be avoided, switch to B.F. Goodrich High Capacity belts which are oil resistant.

Grommets make B.F. Goodrich belts stronger



B.F. Goodrich Grommet belts grip better, transmit more power

Why does a B.F. Goodrich Grommet belt, although more resilient, stretch less, grip better and transmit more power under full load than ordinary V belts? These sketches will explain.

At right is an ordinary V belt. Notice, there's little rubber between plies. Added stress of sudden jerks must be taken by cords. When belt distorts under load, center cords sag, leaving outer cords to do all the work. Dishing action causes belt to pull from sides of pulley groove, reduces gripping surface, cuts ability to transmit full power.



Ordinary belt



Grommet belt

In B.F. Goodrich Grommet V belt (at left), cushioning of rubber surrounding grommet absorbs much of added stress when belt is jerked. Even when belt is distorted under full load, cords of grommet continue to carry a full share of load. Belt does not pull away from groove wall, maintains gripping surface, transmits full power.

Grommets are two extra strong cord loops inside B.F. Goodrich V belts. They're like twisted cables, except they are endless. There are no splices or overlaps in this cord loop—no weak spots to cause premature failure. Since the section where the cords overlap in ordinary V belts is where 80% of the failures occur, this cause of failure is eliminated in B.F. Goodrich Grommet belts.

Ask a factory-trained specialist

For help in selecting V belts for any kind of service, call the man who is a specialist in V belts—your B.F. Goodrich distributor. He can help you cut costs by getting longer life from your V belt drives. *B.F. Goodrich Industrial Products Co., Dept. M-395, Akron 18, Ohio.*

B.F. Goodrich v belts

Enter 1009 on Reader Card

ROCK PRODUCTS, August, 1958

Enter 1001 on Reader Card



FEATURES

American Cement Corp.'s unique merger • Joseph N. Bell 68

This unusual merger of three strong, profit-making companies may be the forerunner of a unique trend in the cement industry

Why wash aggregates? • William A. Rundquist 74

This article, first in a series of four on washing techniques, tells why it is becoming more necessary to wash aggregates

Tie your efficiency to equipment selection • Walter B. Lenhart 76

Six special installations, using some of the latest equipment in the industry, give oolite producer greater productivity

Rigid specs, no water; unusual classifier, new plant 78

Canadian sand and gravel producer licked his specs and washing problems by setting up a new plant with an unusual classifier

Wollastonite spun into rock wool • V. C. Docterman 80

Woolstone, Inc., a pioneer operation in California, is now making rock wool insulation from what used to be a novelty

Steam licks gas sampling problem 82

Dragon Cement Co. has worked out a method of using live, super-heated steam to prevent clogging in their kiln gas sampler

Isotopes—a potential new tool • Leo Walter 86

The day may not be too far away when researchers find a use for radioactive isotopes in the rock products industry

Getting the most from your rotary drill • Paul C. Ziemke 96

A brief article dealing with the use of the rotary drill showing how an operator can obtain more output from his rig

A look at wet grinding • C. A. Rowland 102

A comprehensive article dealing with past and present methods of wet grinding with a glimpse into the future

NISA holds annual meeting 113

Specialized progress reports heard by group. Emphasis is placed on taxes, labor, public relations, transportation

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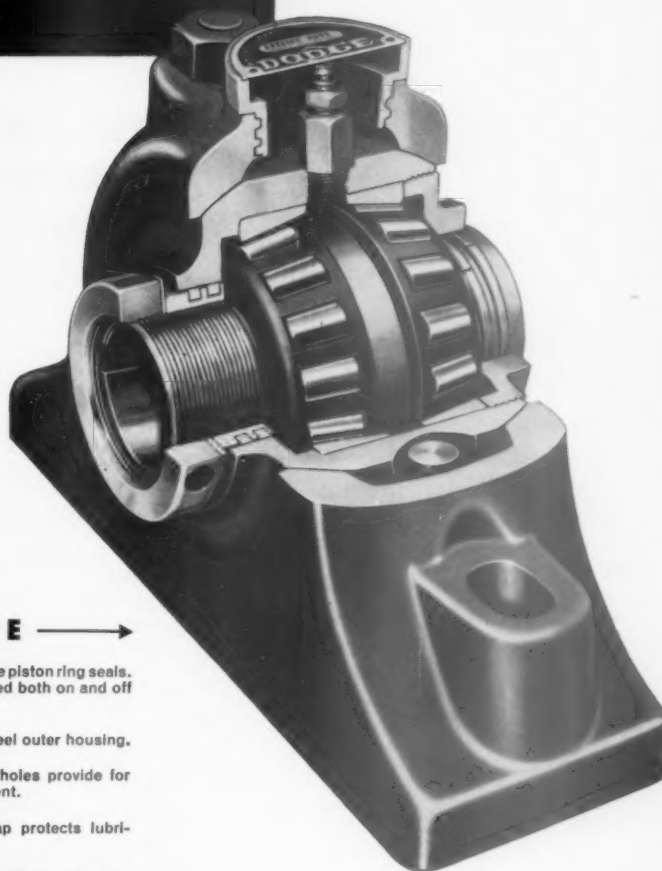
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precision performance—long
life—dependability.



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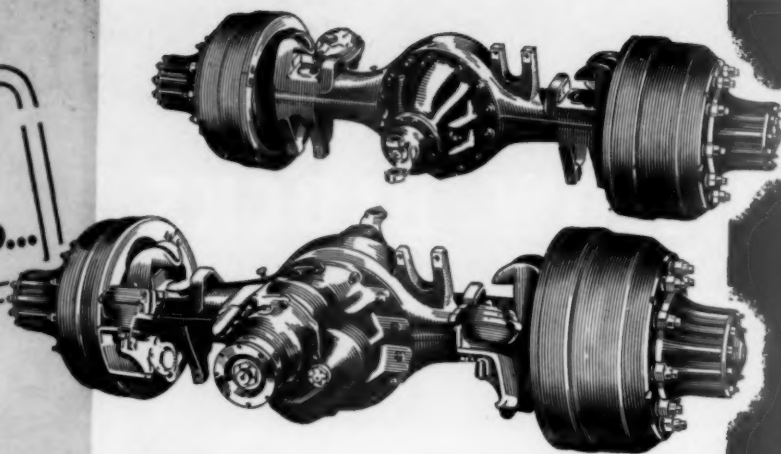
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**For
three
years..**



**Timken-Detroit® Lightweight
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With Big Over-the-Highway Operators!**

These superior features make the difference:

Lighter than any comparable tandem on the market . . . but a real heavyweight when it comes to service. Besides increased payloads you get long, trouble-free service and lower operating costs. Time-proved, Timken-Detroit Lightweight tandem features include:

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Products of **ROCKWELL-STANDARD** Corporation

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ROCK PRODUCTS, August, 1958

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THIS IS THE KIND OF JOB IT'S BUILT FOR!

Built as a Rock Shovel it gives you what you expect of a rock shovel. This big 80-D, 2½ yd. Northwest is one of the seven Northwests bought by Clement Bros., Inc., of Lenoir, N. C. The fact that they have bought seven, shows in itself what kind of service their Northwests have given them.

This Northwest is working in their quarry at Greenville, S. C. in the kind of brutal digging that beats ordinary equipment to pieces.

Northwests are built for Rock Work. Machinery Bases are rugged, heat treated alloy steel castings with cast machinery side frames. Realize what this means. It assures a lifetime of permanence of shaft alignment. It eliminates weaving that is the direct cause of wear. There is nothing else like it.

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If you are planning on new equipment there are many other Northwest advantages you should know about. Let a Northwest man fill in the details.

NORTHWEST ENGINEERING COMPANY

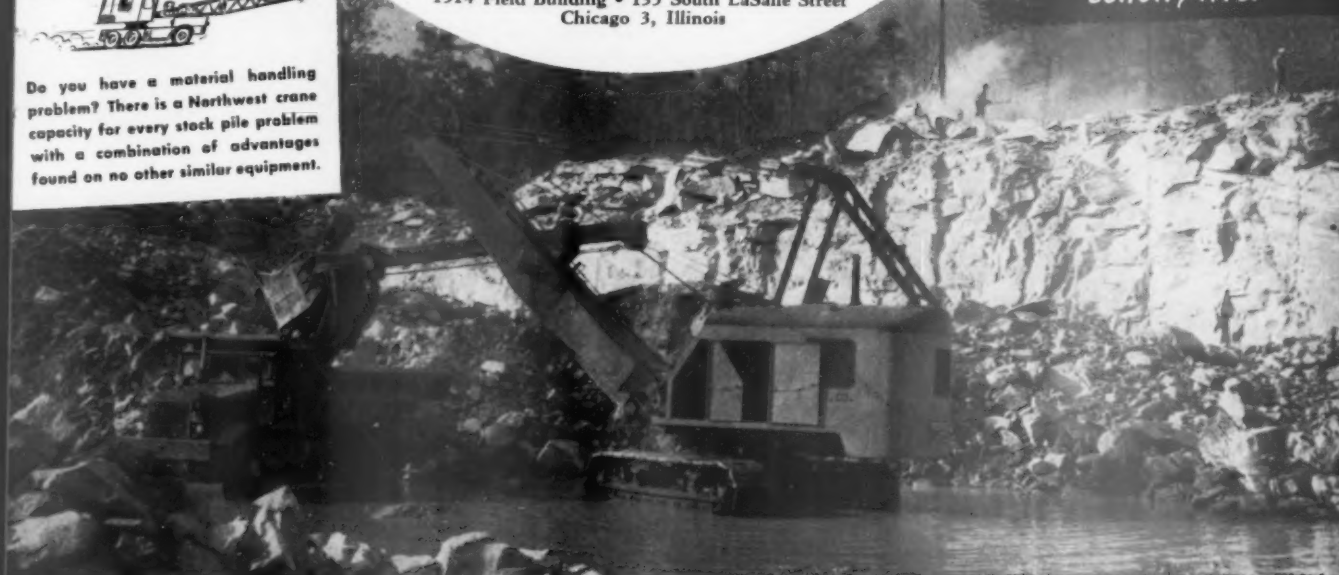
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THE SEVENTH NORTHWEST

Bought by
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Do you have a material handling problem? There is a Northwest crane capacity for every stock pile problem with a combination of advantages found on no other similar equipment.



NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

SHOVELS	CRANES	DRAGLINES	PULLSHOVELS	TRUCK CRANES
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THE GREATEST
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*1½ yard **P&H** Clamshell is a dependable efficient gravel loader!*

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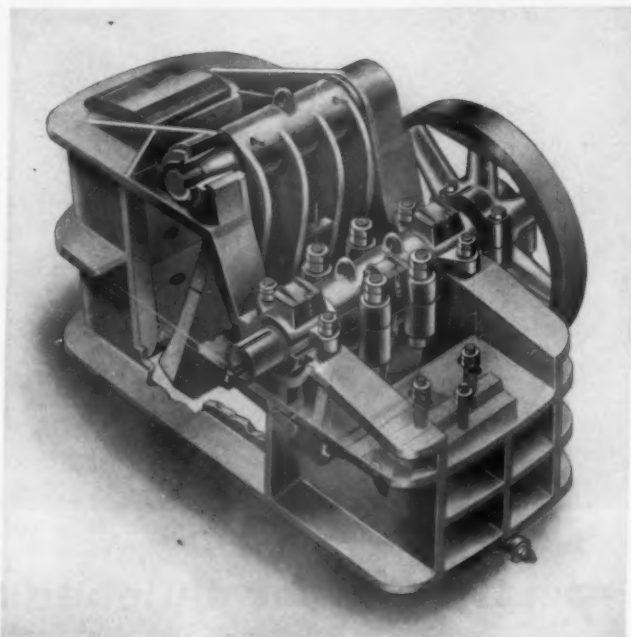


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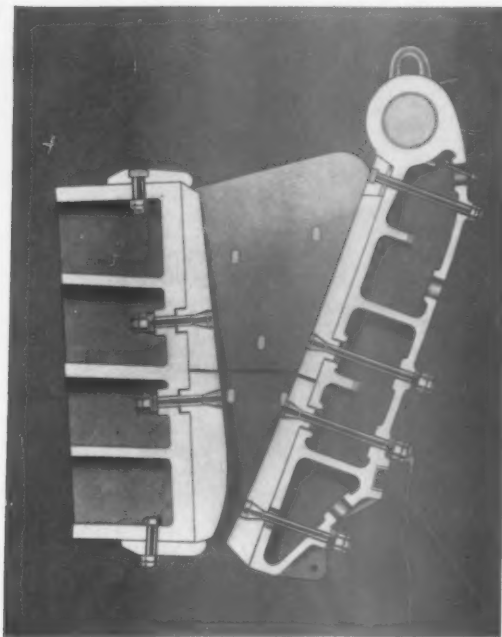
DESIGNED FOR HEAVY PRIMARY DUTY

Traylor-MADE TYPE H JAW-CRUSHERS

REDUCE CHOKING AND PACKING TO A MINIMUM



This cutaway view of the Type H Jaw Crusher shows clearly the sturdy welded frame, the strong pitman, the patented swing jaw suspension and the smooth face curved jaw plates.



Showing the famous Traylor curved jaw plates which reduce choking and packing, producing a finer product in greater capacity.

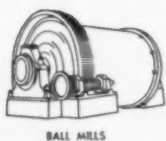
Traylor Jaw Crushers are in daily use in mines and quarrying operations all over the world. For complete information on the Traylor Type H Jaw Crusher, write for Bulletin No. 6105.

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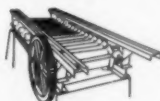
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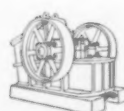
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APRON FEEDERS



PRIMARY GYRATORY CRUSHERS



JAW CRUSHERS



SECONDARY GYRATORY CRUSHERS



You can drastically cut the number of **Texaco Simplified**

A co-ordinated group of just six lubricants for all major quarry equipment has shown significant savings in man-hours and inventories.

Texaco's Simplified Lubrication Plan has been developed to help you streamline your maintenance methods—to keep maintenance expense at a minimum in spite of rising operating costs. Developed in the field, it has already proved its value to others; here's how it can work for you:

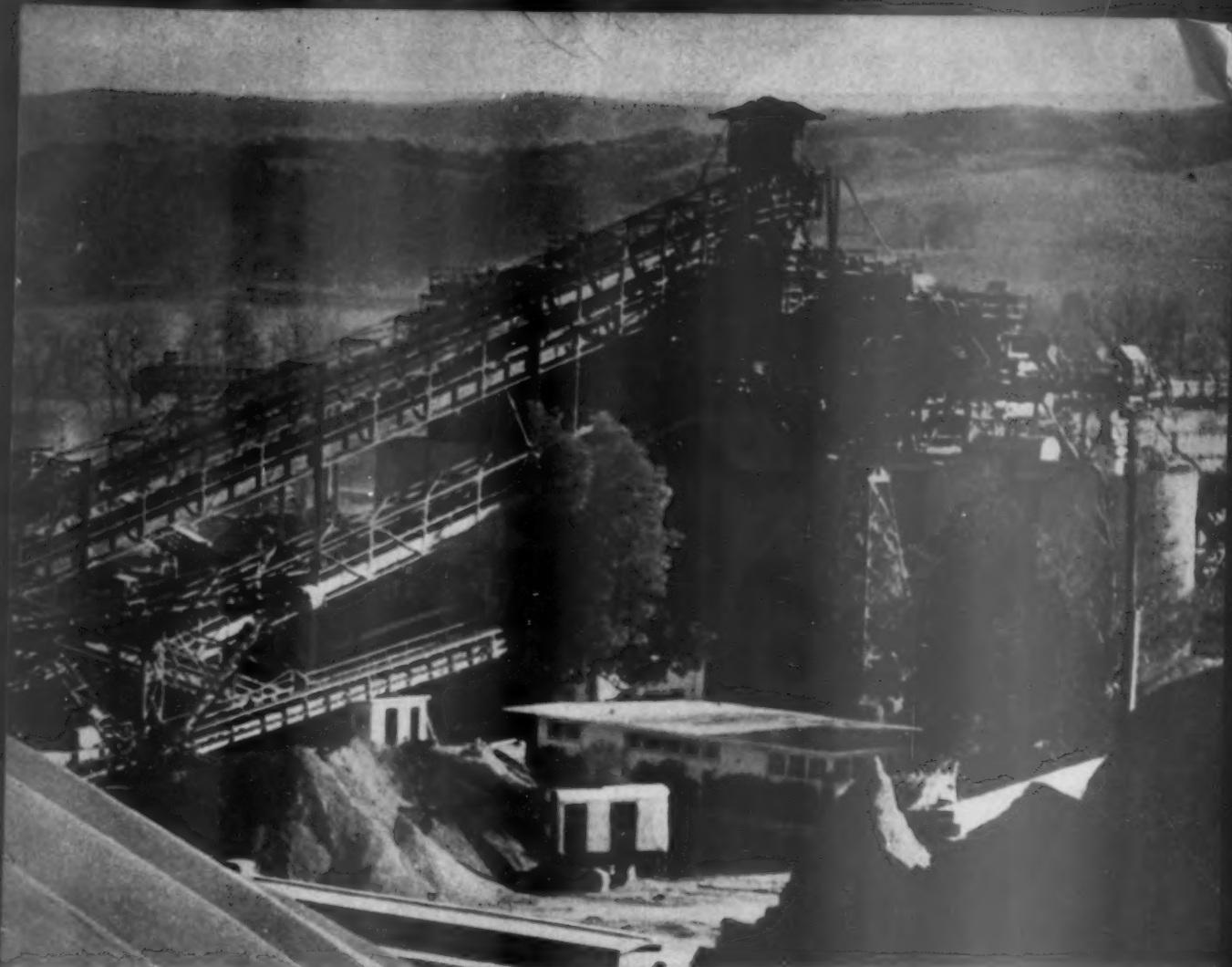
How Simplified Lubrication Plan works

Exhaustive field tests and experience have uncovered this basic fact: *just six Texaco lubricants*

will take care of most quarry equipment needs. This can mean not only a significant reduction in inventory, but above all, a virtual elimination of lubrication confusion and misapplication.

Your nearest Texaco Lubrication Engineer is well qualified to set up a Lubrication Plan geared to your particular needs. He will consider not only your equipment, but also your weather conditions, terrain and work loads, before arriving at the best Plan for you. His expert advice can save you thousands of dollars.

For more information on Texaco's Simplified Lubrication Plan, call the nearest of the more



lubricants required when you use a...

Lubrication Plan

than 2,000 Texaco Distributing Plants in the 48 States, or write to:

The Texas Company, 135 East 42nd Street,
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SIX LUBRICANTS USED IN ONE TYPICAL PLAN:

Texaco Ursa Oil Super Duty for engine lubrication
Texaco Marfak Heavy Duty Special 2 for wheel bearings, chassis, water pump and other grease lubrication

Texaco Regal Oil R&O for hydraulic units

Texaco Crater for wire rope and open gears

Texaco Universal Gear Lubricant EP, for transmissions and differentials

Texaco Track Roll Lubricant for track rollers

LUBRICATION IS A MAJOR FACTOR IN COST CONTROL

(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)



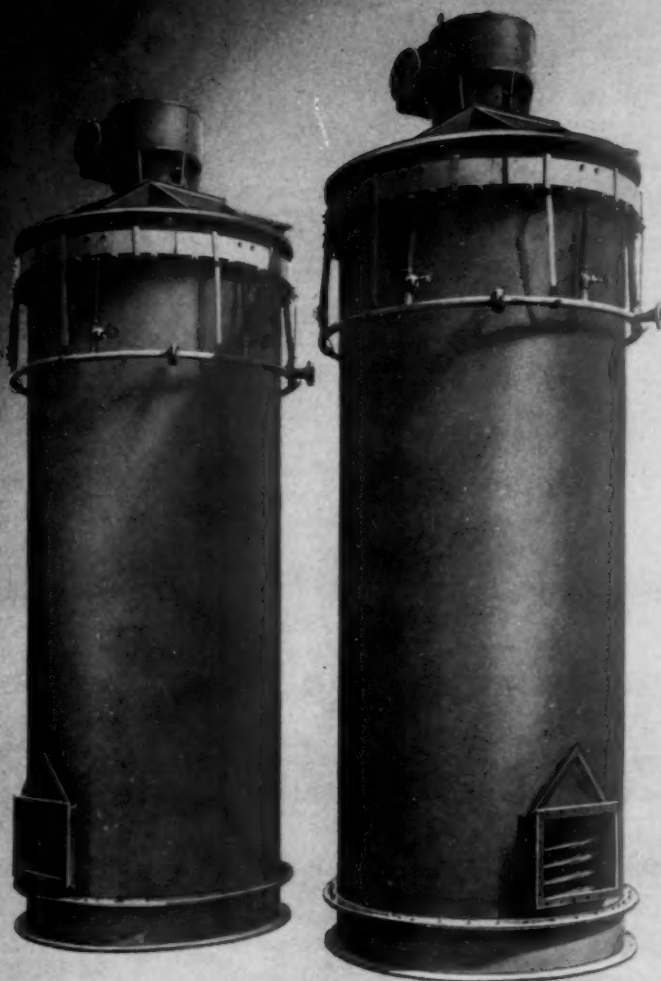
SMIDTH

cement coolers

The Smidth Cement Cooler, developed especially for cooling hot cement to temperatures acceptable for bulk shipment or immediate bagging, is externally water-cooled. The hot cement is introduced at the base and conveyed in a thin layer along the cooled interior surface to the top, where it is discharged. High cooling efficiency is assured by the intimate contact of cement and the water-cooled surface.

The Smidth Cooler may also be used with many other similar dry pulverized materials.

Illustrated here are two 6' 6" dia. x 17' 7" high Smidth Coolers ready for shipment.



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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

August, 1958

A material resembling lightweight cellular concretes now on the market has been developed by Battelle Memorial Institute scientists under the direction of M. Jack Snyder. Originally developed for the printing industry, inorganic planks and panels are being produced in pilot plant by casting a mixture of portland cement with other materials in molds and steam curing. The material can be sawed, nailed or glued. Mr. Snyder reports the following properties for board having a density of 35 to 37 lb. per cu. ft.: Modulus of rupture, 900 psi.; compressive strength, 1,500 psi.; K factor, approximately .5 and moisture expansion (8-hr. immersion), .05 percent.

Under study by the Atomic Energy Commission is the feasibility of using an atomic bomb to dig a harbor in northwest Alaska, close to important large-scale mineral deposits. The studies are part of AEC's Project Plowshare for developing peaceful uses for nuclear bombs, and will center on a spot between Cape Seppings and Cape Thompson, north of the Arctic Circle. If it is shown to be safe and practicable, the explosion could take place in 1960.

Silica with less than one-tenth of one percent impurities—that is the claim of a Tuscola, Ill., commercial silica plant patterned after the Degussa plant at Rheinfelden-Baden, Germany. The Tuscola operation of Cabot Carbon Co. is said to be the first in the United States to produce silica synthetically. Silicon tetrachloride and hydrogen gas are combined in a vaporizing and burning process and two products result: silica and hydrogen chloride. The plant has a capacity of from 7,000 to 8,000 lb. of silica a day and 3,000 tons of hydrogen chloride gas a year.

Mica washed from North Carolina mountains is being dredged from Davy Crockett Lake just upstream from TVA's Nolichucky Dam. International Minerals and Chemical Corp. is recovering the mica with dredge and separation equipment. It found, through exploratory drilling, that the silt in a five-mile delta contained six to eight percent mica. Then it took a long-term lease on the site and hired TVA geologist, Charles E. Hunter, as production manager. The deposit is 40 ft. deep in places, and is estimated to contain upward of half a million tons of commercial mica.

Irradiating coal dust with gamma rays and dispersing it in fuel oil promises a cheaper, better burning locomotive fuel; in fact, Denver and Rio Grande Western Railroad is envisioning a \$400,000 cut in its fuel bill annually. Radiation reduces the particle size of the coal, say railroad researchers.

Production of synthetic anhydrite from industrial waste of hydrofluoric acid plants using fluorspar may be initiated in Canada by the International Anhydrite Corp. A European development, the process results in a calcium sulphate binder for wall plaster, flooring mixes and wallboard manufacture. Therefore, it would be competitive with gypsum and portland cement.

Mineral, forest and power resources in northern Alberta, Canada, have been stimulating discussions between the government and the Canadian National and Canadian Pacific Railways about building a 400-mile railway from McMurray, Alberta, to Pine Point on Great Slave Lake. The line would gain access to 27 billion cu. ft. of saw log timber, 300 million sq. ft. of pulpwood and 3 million hp. in hydro potential. As far as mineral resources are concerned, Toronto's **Financial Post** points to the Alberta tar sands as a starter. Of the score of companies conducting surveys, Royalite Oil Co. has announced plans to spend \$50 million on a processing plant and pipeline.

Bright-colored tires to match today's automobiles are among the products being researched at Columbia-Southern's new laboratory at Barberton, Ohio. In experimental tires of colored rubber having white hydrated silica as reinforcing agent instead of carbon black, tread life is about 85 percent that of conventional black tires. The lab also is studying other uses for silica in white rubber goods, paper and other products.

Housing starts in May reached 1,010,000 annual rate, up from 950,000 in April, according to the Labor Department. This was the first time the rate passed 1,000,000 since January. In May, 1957, the seasonally adjusted annual rate was 994,000. Government figures showed construction outlays in May rose to \$4.1 billion, up \$400 million from the April total. Public construction in the January-May period of 1958 rose four percent over the 1957 period, reflecting increased spending for highways and public housing. Private construction work was slightly below the year-earlier level.

Underground drains are dug and lined in one operation with a machine described to the Building Research Institute by C. D. Busch and T. W. Edminster of the U. S. Department of Agriculture, Beltsville, Md. The machine is an underground plow to which a roll of plastic sheet and a roller for forming the sheet into tubing have been attached. It builds water and sewage drains, called "mole holes," at one-fourth the cost of present methods, it was reported.

A hydraulic backfill method was used to close the workings of an old chalk mine under a section of London. Discovered when buildings began to settle, the 60 to 80-ft. workings were explored and a new, 200 ft. long heading was driven to intersect them. Shafts were sunk and the workings were filled by washing pulverized fuel ash from power stations into the voids. Sections were filled in turn, each being blocked off by a temporary bulkhead until the material consolidated.

A barge shipment of liquid sulfur, 5,000 long tons, made the 1,204-mile trip between Beaumont, Texas, and St. Louis recently. Dravo Corp., maker of the new two-barge integrated tow, said it was the first barge shipment of liquid sulfur ever made between the two cities. Temperature of the sulfur was held between 240 and 270 deg. F. to keep it in the liquid state.

Here's an example of super salesmanship: Developers of new home tracts in California hired schoolboys to jot down the auto license numbers of sight-seers driving around looking at lots. Numbers were traced and the motorists received "buy now" letters from tract salesmen.

The editors

Removing overburden from diatomaceous earth



CAT DW20-No. 456 RIG PROVES BEST

Here in Basalt, Nevada, the Dicalite Department of Great Lakes Carbon Corp. has been mining diatomaceous earth since 1945. Thick layers of gravel, clay and lime overburden are removed to get at layers of the diatomaceous material below.

Quarry Superintendent Joseph Marinelli says: "Our DW20 (Series E) hauls larger loads faster. We especially like the LOWBOWL Scraper. It loads easier and cuts a wide enough swath for the push tractors (D8s) to fit into. The DW20 handles well—and another feature we like is the electric starting."

Now a new DW20 (Series F) Tractor is available. It features a Super-Turbo Engine that pro-

vides 320 HP (maximum output) ... 28% torque rise ... top speed of 35.8 MPH!

The Super-Turbo incorporates a new concept in diesel engine turbocharging. Its heart is a revolutionary air induction system, unique in earth-moving machines ... and another Caterpillar first. This system allows use of more of the Turbocharger's potential than was possible before. Results: twice as much torque rise, higher horsepower, better acceleration and gradeability. But more important, faster cycles, greater production and more profit—for you.

Get the full story from your Caterpillar Dealer. Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

FIND YOUR CATERPILLAR DEALER IN THE



CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**WANTED—
THE HARD WORK**

3 reasons why you should specify NORDBERG GRINDING MILLS

1. Advanced Engineering

Nordberg mill design reflects significant technological improvements that may measurably affect your installation and operating costs. Sealed trunnion bearings; positive bearing lubrication; optimum life of wearing parts are among the features that will benefit you.

2. Quality Manufacture

Nordberg Mills are (1) precision built to rigid specifications in shops renowned for (2) skilled manufacturing personnel, and (3)

modern machine tools and equipment to assure quality workmanship. Good reason why the name **NORDBERG** has always signified the *ultimate* in mining, quarrying and process machinery.

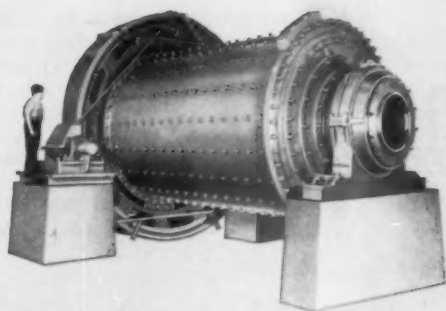
3. Dependable Operation

A team of experienced application engineers with a sound understanding of your milling operations qualifies Nordberg to serve you. More important, it assures you of the right machinery for the job . . . machinery that must be dependable and will continually produce to your specifications.

Nordberg Grinding Mills are built to meet specified conditions for wet or dry grinding—in the manufacture of cement; the fine reduction of metallic and non-metallic minerals; and in numerous other processes where friable material must be comminuted to fine sizes at low cost per ton. They are available with grate, overflow or peripheral discharge . . . and are built in sizes from 6 feet to 13 feet in diameter and up to 50 feet in length.

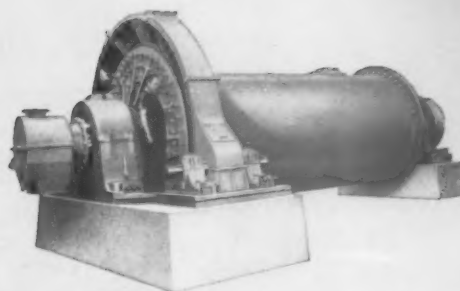


58 Nordberg 10' dia. Grinding Mills
in a Taconite Iron Ore Concentrator
Building.



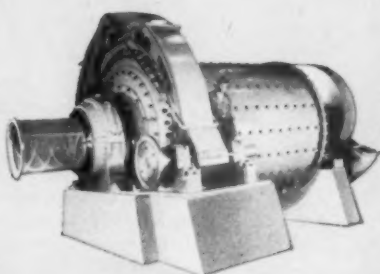
ROD MILLS

For the coarser or primary grinding stages of milling plants.



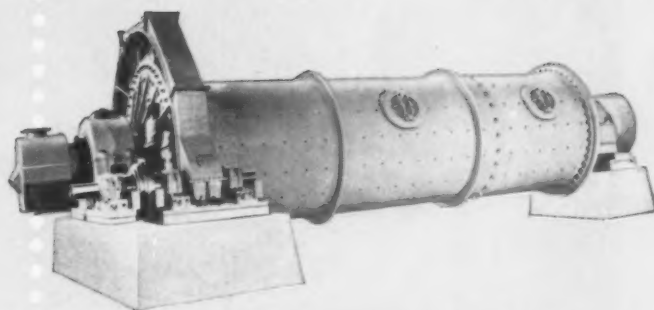
TUBE MILLS

These Nordberg units are used primarily where extremely fine grinding is required.



BALL MILLS

Having principal application in the fine grinding of ores, and minerals, and as preliminary mills operating in tandem or series with tube or compartment mills.

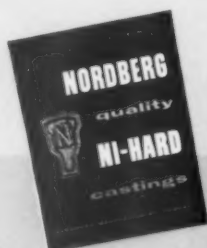


COMPARTMENT MILLS

For multi-stage grinding to ultra-fine specifications, these Nordberg Mills are built in lengths to 50 ft., with two, three, or more compartments.



BULLETIN 232 covers the complete line of Nordberg Grinding Mills for efficient, low cost processing of ores and industrial minerals. Write for a copy today.



BULLETIN 263 describes the advantages of using Nordberg "NI-HARD" for mill liners and other machinery components subject to rapid abrasive wear. Copy on request.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG

ATLANTA • CLEVELAND • DALLAS • DULUTH • HOUSTON • KANSAS CITY • MINNEAPOLIS • NEW ORLEANS • NEW YORK • ST. LOUIS
SAN FRANCISCO • TAMPA • WASHINGTON • TORONTO • VAN-
COUVER • GENEVA • JOHANNESBURG • LONDON • MEXICO, D.F.

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GM358



SYMONS®
GYRATORY CRUSHERS



SYMONS
CONE CRUSHERS



NORDBERG
MINE HOISTS



SYMONS VIBRATING
GRIZZLIES and SCREENS



NORDBERG ENGINES

**KOEHRING
WORK
CAPACITY
in action...**



Mining phosphate — After stripping overburden from a deep vein, a Koehring® 605 dragline (left) loaded phosphate out of the narrow cut. On this type of operation, the big 605 can be used with 50 to 110 feet of boom — and handles $1\frac{1}{2}$ to $2\frac{1}{2}$ -cu. yd. dragline bucket, depending on weight of materials. (Check its other work capacities in chart on the next page.)



Heavy-duty 2-yard — Here is another Koehring size worth looking into — the 2-yard 805, with 25-foot deep-section shovel boom and $18\frac{1}{2}$ -foot dual dipper sticks. Fully convertible to clamshell for stockpiling, or dragline for stripping — handles 2 to 3-yard buckets on 50 to 150-foot boom. The 805 does your heavy lifting, too — safely handles loads up to 52 tons!



Introducing . . . the new 435

Now, Koehring brings you 35 tons of lift capacity, plus high-speed mobility on rubber, for lifting, material-handling, general utility and maintenance work around mines, quarries. It's the new 435 truck crane (shown above). Big, rugged — yet, is quickly convertible from fully-equipped crane to roadable machine for highway travel.



Quick facts on KOEHRING WORK CAPACITY:

ON RUBBER	MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
	205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
	305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
	405	4-axle truck	70,000 lbs.	at 15-ft. radius
	545	4-axle truck	90,000 lbs.	at 15-ft. radius
ON CRAWLERS		Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
	205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
	305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
	405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
	545	(Crane only — 85% rating)	90,000 lbs.	at 12-ft. radius
	605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
	805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
	1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra lift capacity means . . . **MORE WORK CAPACITY WITH ALL ATTACHMENTS**

Dumping height: 40 feet-10 in. —

Owner of this strip mine needed a long-reach shovel — brought in a Koehring high-lift 1205, equipped with 2½-yard dipper on 50-foot boom. Working with boom at 45° angle, it has a cutting height of 51 feet-4 inches — and dumps at heights up to 40 feet-10 inches. This big 1205 is also available with 3-yard dipper on 40-foot high-lift boom — or as a standard 3-yard with 30-foot shovel boom for toughest digging. Its power, strength and load-stability as a shovel pay off in *extra work capacity* with all attachments. Takes 3 to 4-yard dragline or clamshell buckets on 60 to 170-foot boom — has 95-ton capacity as a lift crane (based on 75% rating). Koehring distributor has complete details on this, and other sizes. Call him today.

KOEHRING

DIVISION OF  **KOEHRING CO.**
Milwaukee 16, Wisconsin

Koehring excavators and cranes also manufactured in:
CANADA • ENGLAND • SPAIN • JAPAN

Enter 1059 on Reader Card

EDITOR'S PAGE

George C. Lindsay, Editor

A revolution in industrial management

May be starting in the rock products industries

A NEW PHILOSOPHY OF INDUSTRIAL MANAGEMENT has invaded the rock products industries. If it proves to be effective—and experience so far shows that it is—a whole new pattern of profitable opportunity in corporation structure may lie ahead for our industries.

Formation of the American Cement Corporation the first of this year led the way in application of the new management philosophy. Three highly successful cement companies—Hercules, Riverside and Peerless—were combined into American in such a way that important individuality of each was kept in the combination. Furthermore—and this is important—the philosophy of each company management was similar: they believed that shortcomings of other types of mergers could be overcome and that definite, needed advantages could be obtained at the same time.

What's so different in the American merger? Well, first of all, the concept of pooling interests of many with no loss of individuality is new and intriguing. Merger and combination are not new to the cement industry. But in the past an individual company has more or less been swallowed up in the combine. That system had definite drawbacks because of the very nature of the cement industry.

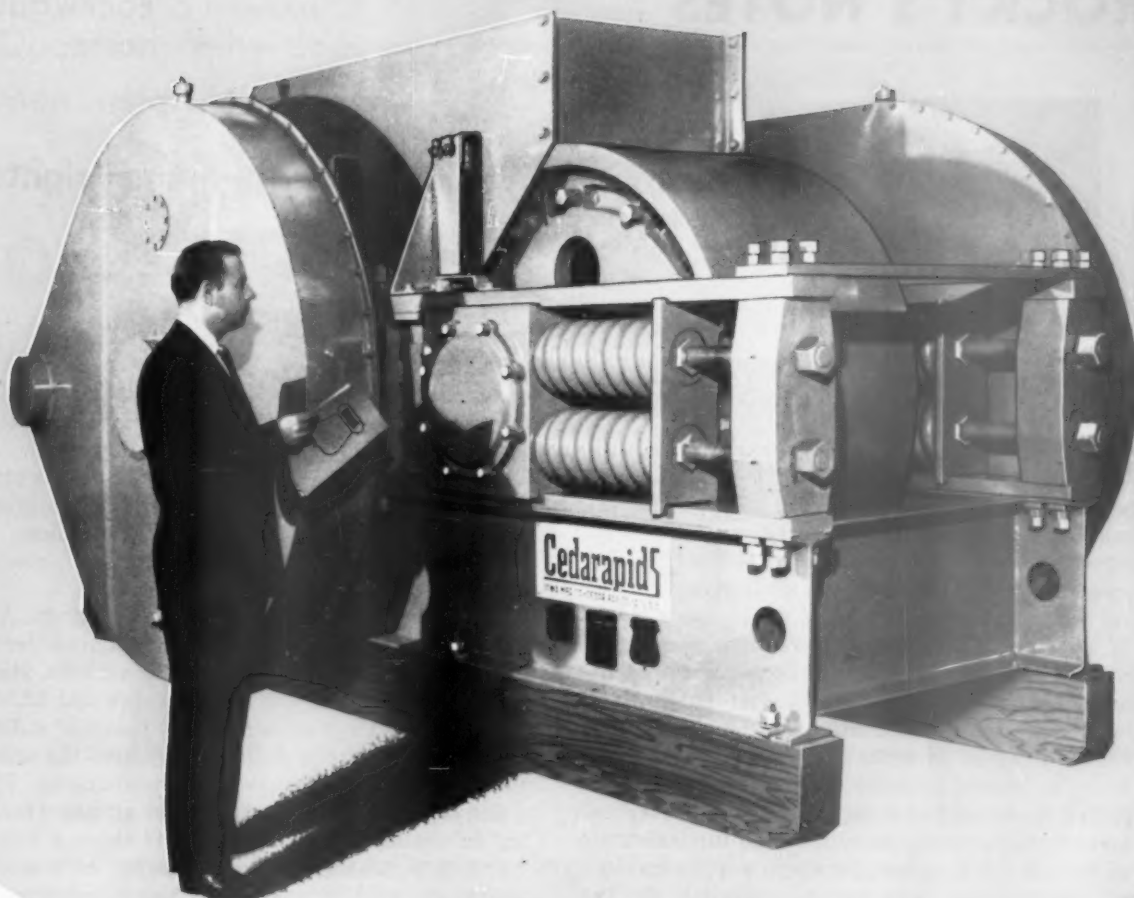
Secondly, the merger was not consummated merely to create bigness; it was a pooling of interest of successful companies for mutual benefit. One of the main benefits is a stronger financial position that offers more opportunity to expand with the industry as it grows in the future.

A third difference—and by no means the least important—is that progress or the chance for it is improved through the combine of companies which staunchly believe that continued progress is essential to success.

Here's a real lesson in modern management philosophy! We've been told that we couldn't have our industrial cake and eat it, too—and most have accepted the proposition as a truism. But three cement companies have said "We think we can," and actually are trying it.

Hooray for them! The project is worth watching. You can begin by reading the full story of the merger on page 68.

You're tons ahead with this **BIG** CEDARAPIDS 5530 ROLL CRUSHER



These big-performance features tell you why

Big Secondary Production of material from $\frac{1}{4}$ " to 5" pours steadily through this big roll crusher with its 30" wide rolls, to keep aggregate plants operating at a highly profitable pace. The big 55" diameter rolls nip into larger size feed material—as a result, the primary crusher can be opened to increase over-all plant capacity.

Low Maintenance assures big profit. Every feature of the 5530 Roll Crusher is engineered to give steady high production day-in and day-out for month after month. To take the stress of crushing, bearings are designed for extremely heavy-duty service. Extra-heavy countershaft assures steady, high capacity even under surge loads. Rugged frame is engineered with high-strength steel I-beams and welded crossbeams to hold countershaft bearings, gear and pinion, and stationary roll bearings in rigid alignment. You get high-tonnage output day after day from the Roll Crusher that's built to take punishment!

Extra Power, with large, heavier-than-average flywheels turning at high speed on an extra-heavy-duty counter shaft, easily handles surge loads due to uneven

feeding . . . and gives this Cedarapids Roll Crusher the most economical power consumption rate per ton of material crushed.

More Efficient Feeding also steps up production. Material is dropped *between* the rolls. Its speed of falling permits maximum penetration into the crushing area, allowing faster feeding and resultant greater hourly output. A special feed box with an angle divider spreads material across the full width of the rolls to utilize the entire crushing area and prevent uneven wear on the roll shells.

Other job-proved features include: Patented shear plates that protect the crusher from uncrushable material without resorting to numerous heavy springs; extra-rugged spider cores for roll shells; easy shim adjustment for rolls; a wide range of roll shell surfaces including smooth, corrugated, or beaded.

Cedarapids

Built by
IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.



Reaffirmation of fundamental human rights

HAVING LIVED THROUGH a generation that has given organized labor every legal advantage possible, even apparently sometimes at the expense of public health and safety, we often wondered how our court of last resort—the U. S. Supreme Court—would meet the issue of an individual workman wrongly deprived of earning a living by labor-union coercion. Now we know, for in two recent cases that issue has been resolved, not directly and not unanimously, unfortunately. The failure of the Chief Justice and one Associate Justice to agree with the court majority, it seems to us, is further evidence of how far we have departed from original concepts, because of political and economic considerations, of the fundamentals of British common law, on which our Declaration of Independence and our Constitution of the United States are primarily based—as were also the various state constitutions.

Much has been written and comments in the newspapers and business press are many, but we have yet to see what should be, in our estimation, a discussion of the real significance of these decisions to all of us. The two cases before the court were as follows: A suit for picketing damages was filed against the United Auto Workers Union by Paul S. Russell, a nonunion employe at the Decatur, Ala., plant of Calumet & Hecla, Inc. He lost five weeks' wages during a 1952 labor dispute; he was prevented from entering the plant by "mass picketing and force and violence." He was awarded \$10,000 in damages from the state's highest court. In affirming this decision, the U. S. Supreme Court held "the power to impose punitive sanction is within the exclusive jurisdiction of the state courts." The highest court said the National Labor Relations Board is limited to ordering the recovery of back pay but cannot award punitive

damages. If the state courts did not have this power either, the Court held, the effect would be to grant unions "substantial immunity from the consequences of mass picketing or coercion . . ." The union argued that the right to strike was protected by federal law and could not be "subjected to regulation by the opinions and prejudices of jurors in the thousands of state trial courts throughout the nation."

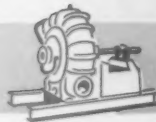
The second case involved the International Association of Machinists. A California court ordered the union to pay a San Francisco machinist, Marcos Gonzales, \$6,800 for loss of wages and \$2,500 for "grievous physical and mental pain and suffering." In addition, the state court ordered the union to reinstate Mr. Gonzales to membership. The union had ousted the machinist for allegedly making false and malicious statements about a fellow member. Gonzales sued on the ground he was unable to get work because of his loss of union membership. The union did not oppose Mr. Gonzales' reinstatement, but challenged the power of the state court to award damages. Here again, the union argued only the National Labor Relations Board had such authority. The U. S. Supreme Court upheld the state court's powers. The Court said the possibility of conflict with federal law in the state court's damage award "is no greater than from its order that (Gonzales) be restored to membership."

In both cases, the issue before the U. S. Supreme Court was not the individual workman's inherent rights, but whether or not the state courts had jurisdiction in maintaining such rights. It is ironical that the labor union attorneys were the ones responsible in getting the issue before the U. S. Supreme Court. The key to the Court's decision is in this quotation from Justice Burton's majority opinion: "We conclude that an employe's right to recover, in the state courts, all damages caused

Please turn to page 136



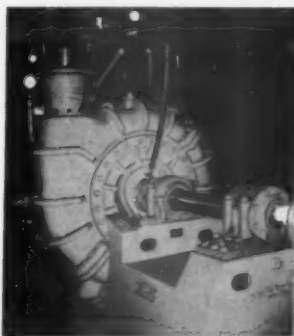
Another Customer Speaks



Question: Why does a
Man Install His

THIRD THOMAS PUMP?

or his 5th — or his 8th?



MOBLEY CONSTRUCTION COMPANY, INC.

PRODUCERS OF
WASHED AND SCREENED SAND AND GRAVEL

POST OFFICE BOX 109

MORRILTON, ARKANSAS

May 12, 1958

Thomas Foundries, Inc.
Birmingham, Alabama

Gentlemen:

Our second Thomas Pump, a 12", was installed on our Newport Dredge December 16, 1957, replacing a Manganes Steel Pump. The Thomas Pump has cut our loading time over 50%, as we now load 375 ton barges in 55 minutes.

Our first Thomas Pump (14") was installed on our Dardanelle Dredge early in 1954, and we expect to have our third Thomas Pump (12") in production at an early date.

We feel certain that this third Thomas Pump will give us the same satisfaction and efficiency as the two Thomas Pumps we now have in operation.

Thanking you for many favors extended, we are

Very truly yours,

MOBLEY CONSTRUCTION COMPANY, INC.

James B. Mobley
James B. Mobley
President

Answer: Because of his satisfactory experience with the first ones — because operating economy demands it!!

Here is a good example of what has caused the WIDE SWING by sand and gravel producers to Thomas DURABLE Dredge Pumps.

Note Mr. Mobley's letter: "— has cut our loading time 50 percent—" "We expect the same satisfaction and efficiency from the third." This follows the installation of their first 14" Thomas Pump at Dardanelle early in 1954.

Mobley Construction's experience is being duplicated by sand and gravel producers in all sections of this country. Designed especially to permit modern, hard, abrasion resisting materials to be used in ALL the wearing parts, the Thomas Pump is setting new records for extremely long life, freedom from troubles, very high efficiency, high production.

That's the reason Mobley buys more Thomas Pumps—that's the reason for the SWING to Thomas—that's the reason:

"YOU CANNOT BUY AT ANY PRICE, A MORE DURABLE PUMP FOR SAND AND GRAVEL—YOU CANNOT BUY ANOTHER PUMP THAT WILL MAKE YOU AS MUCH MONEY."

Write for details and descriptive literature.

Available in sizes from 6" through 16".

Thomas DURABLE Dredge Pump on Dredge of Mobley Construction Company at Newport, Arkansas.



THOMAS FOUNDRIES, Inc.
P. O. BOX 1111 BIRMINGHAM, ALABAMA

ONLY CATERPILLAR GIVES YOU THE OIL

Here is what you should know about its money-saving and operating advantages

How much better is the exclusive Caterpillar oil clutch than the ordinary clutch? It can be summed up in this short statement:

When the Caterpillar oil clutch is ready for *adjustment*, the ordinary clutch is ready for *replacement*. Experience in the field proves it.

In the years since 1954, when Caterpillar introduced this remarkable advance in earthmover power trains, owners all over the country have reported thousands of hours of oil clutch operation free of adjustment or repair.

Typical of these reports is this one from Myron Omernik, land improvement contractor of Custer, Wis.: "Our D7 has operated 5,100 hours without any oil clutch repairs or adjustment."

This performance record means two clear-cut money-saving advantages:

1. Virtual elimination of down time caused by clutch failure.
2. Greatly reduced repair costs.

But in addition to its economy features, the oil clutch also provides superior operation. Here is why:

IMPORTANT OIL CLUTCH FEATURES

Independent oil pump assures positive lubrication and cooling for clutch plates, bearings and other vital moving parts.

Heavy-duty bearings have extra capacity for long service life.

Clutch brake helps match clutch and transmission speeds — makes shifting easier.

Removable coupling allows clutch to be removed without disturbing engine or transmission.

Double clutch plates are metallic-faced for heavy-duty torque transmission.

Intake screens protect the oil pump from foreign material.

1. A hydraulic booster on the D9 and D8, operated by clutch oil pump pressure, takes the effort out of clutch operation but retains clutch "feel."

2. Clutch "fade" because of overheating is practically eliminated. The oil in which the clutch parts run is pumped directly from the crankcase. This means the clutch temperature never rises above engine temperature.

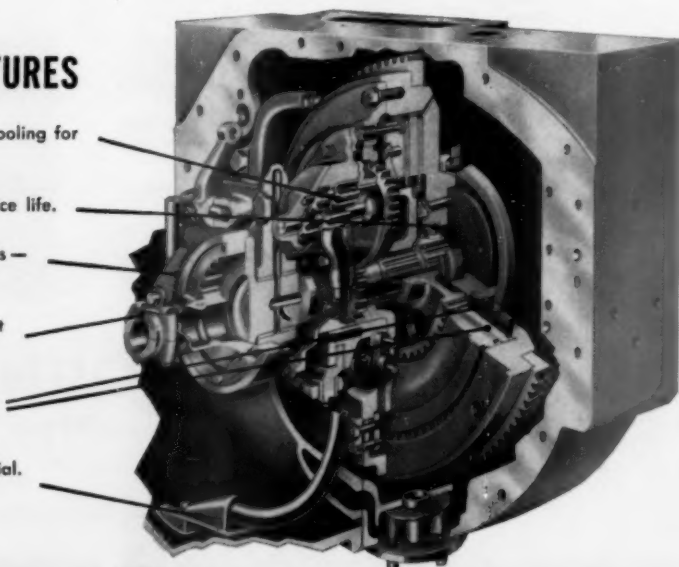
3. A clutch brake helps match clutch and transmission speeds—making shifting easier.

Here, in brief, is how the oil clutch works:

Three metallic-faced plates are separated by oil films at all times except for the last revolution or two as the clutch is engaged. Oil enters the inner diameters of the clutch plates and circulates between them by means of grooves in the clutch facings, carrying away heat and reducing wear. All clutch parts are constantly running in oil.

The exclusive Caterpillar oil clutch is not an "extra"—it is *standard equipment* on the D9, D8, D7 and D6 Tractors, all Traxcavators, on the No. 12 Motor Grader and on the MD6 and MD7 Pipelayers. Yet it is an "extra" in *value* that is unmatched in the industry.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.



CLUTCH



CAT D9 TRACTOR: "We have operated this Cat D9 Tractor for 4,000 hours in the toughest kind of work without any repairs to the oil clutch," says Frank Hill of the Silva & Hill Construction Co., Los Angeles, California. "I just wouldn't consider buying a tractor without it now."



CAT NO. 955 TRAXCAVATOR: "In over 4,000 hours on our two hard-working No. 955 Traxcavators, we have made only one simple adjustment on an oil clutch and that took only about a half hour. It's much simpler than the old friction-type clutch," says M. J. Lutz of Bethel Park, Pennsylvania.

OWNERS REPORT TROUBLE-FREE OPERATION



CAT NO. 12 MOTOR GRADER: "Our No. 12 is starting its third season without interruption due to clutch trouble." With only one clutch adjustment in over 2,000 hours, Francis Bloomer, President of the John F. Bloomer Co., Appleton, Wisconsin, says, "We like the No. 12 with the oil clutch." This company, with 35 years of road construction work, owns a fleet of Cat-built equipment consisting of No. 12s, D9, D8s, DW21s.

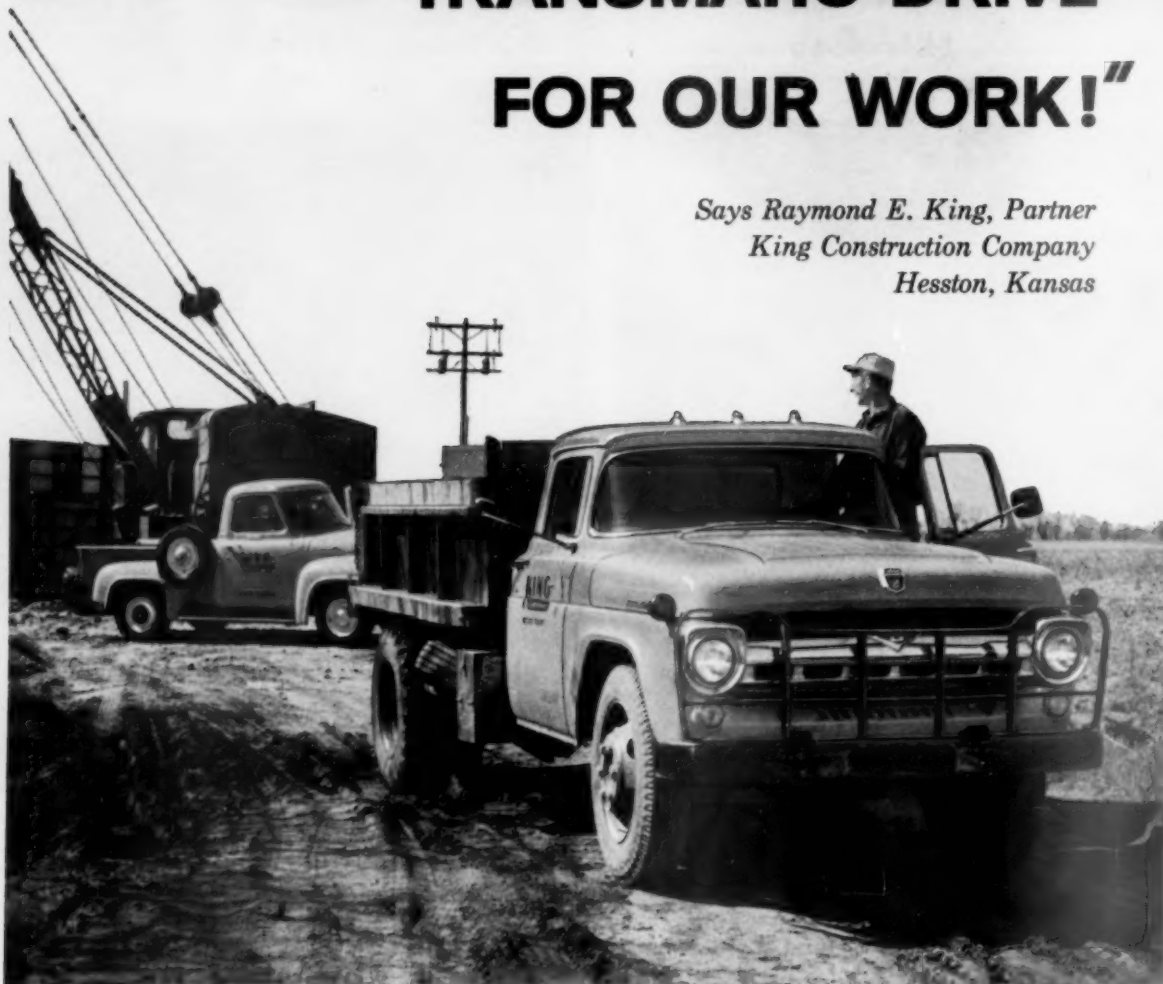
CATERPILLAR

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**LEADER IN
EARTHMOVING RESEARCH**

"YOU CAN'T BEAT FORD'S TRANSMATIC DRIVE FOR OUR WORK!"

*Says Raymond E. King, Partner
King Construction Company
Hesston, Kansas*



"For off-the-road work and hauling out of sand and gravel pits our Ford two-tonner with fully automatic transmission sure handles the loads

"We've put 42,000 miles on our F-600 dump in the last 9 months and are very satisfied with it. Gas mileage is good and tire wear is reduced. Another big advantage of Transmatic Drive is that you don't tear up axles coming out of sand pits.

Also, its torque converter multiplies engine torque to get loads started and prevents harmful engine lugging. To do our job with a truck not equipped with Transmatic Drive would mean buying a truck at least one size larger."

Finance the easy one-stop way!

Ask about the new

**FORD FLEET TRUCK
FINANCE PLAN!**

**Bring extra savings
to your business . . .
make your next truck
a FORD!**

Official registrations for 1957 show that *American business buys more Ford trucks than any other make*. There are many reasons for this popularity . . . many reasons for *you* to make your next truck a Ford!

To begin with, Ford offers a complete line of over 360 truck models, ranging from pickups to giant tandems. And there are Ford Dealers almost everywhere, ready to help you select the truck best suited for your individual job. They're ready with modern service facilities, trained mechanics and low-priced Ford parts to keep your trucks on the job, earning for you.

Ford trucks are your best buy! Ford's initial costs are *low* and resale value is traditionally high. The modern Ford Style-side pickups are the lowest-priced models available with full cab-wide body . . . giving you 23% more loadspace than any traditional pickup box.

Value-packed Ford Tilt Cab trucks offer exceptional payloads, maneuverability, service accessibility and driving ease. They're America's most popular tilt-cab line *by over two to one!*

Only Ford offers the economy of Short Stroke power in all engines, Six or V-8. And Ford's Heavy Duty V-8's offer new, advanced durability features. The modern Ford Six, available in Light and Medium Duty F- and P-Series trucks, is equipped with an economy carburetor that gives you up to 10% greater gas mileage. It's plenty peppy, too, with more horsepower per cubic inch than any other six in its class.

Ford's rugged cab and chassis construction means these new '58s are built to last. Every Ford has safety glass in every window. All this plus proof that Ford trucks last longer adds up to America's No. 1 truck value.

See your local Ford Dealer for the latest in '58 trucks or the best in A-1 used trucks.



King Construction Company's Ford F-600 with 178-hp Heavy Duty V-8 engine is an all-around performer. Transmatic Drive enables driver to easily back truck into position.

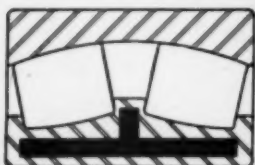
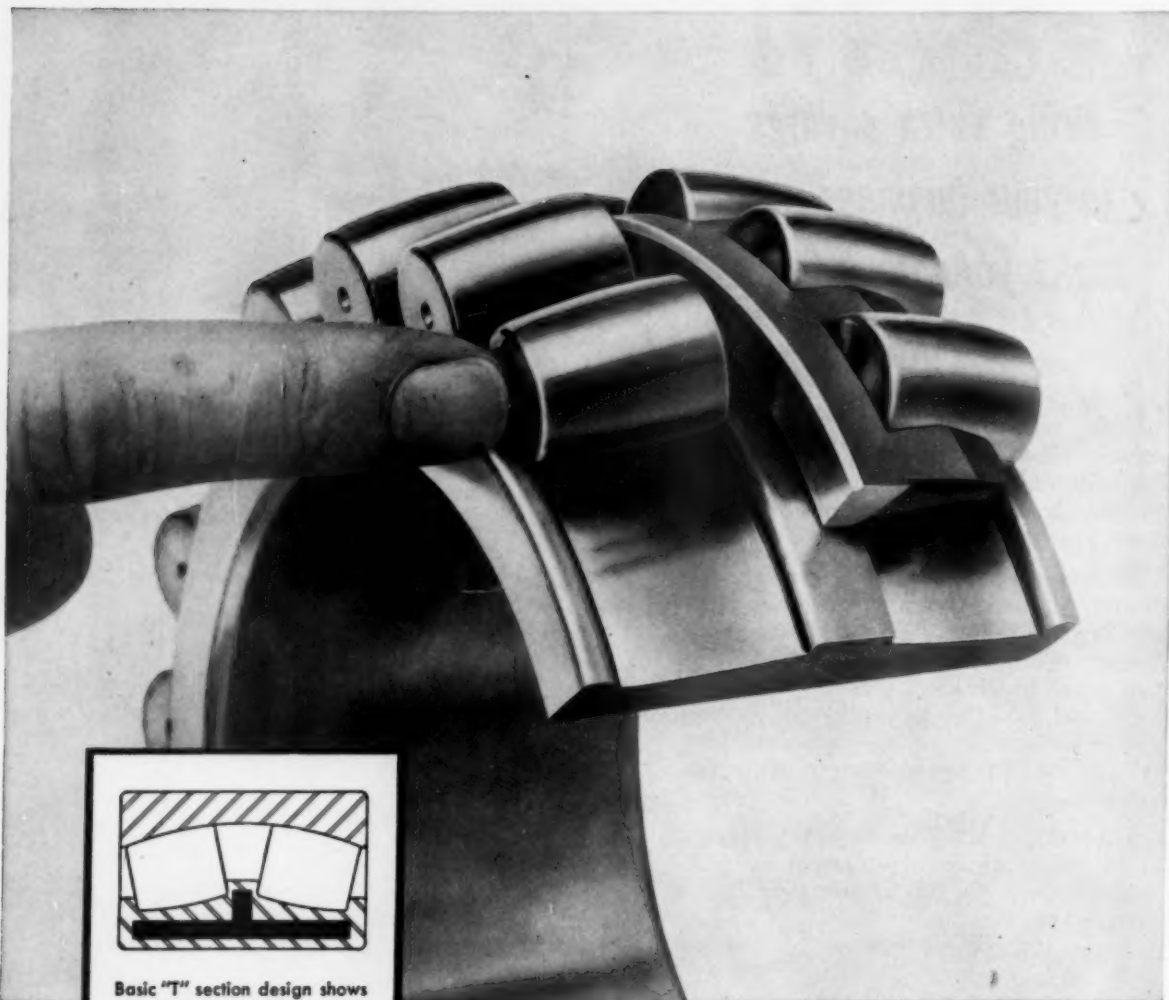


Carrying 5 to 6 yards of sand or rock, this Ford dump truck hauls many loads daily from nearby production sites.

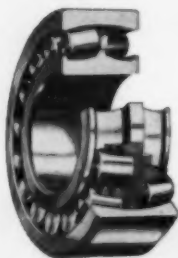
FORD TRUCKS COST LESS

**LESS TO OWN . . . LESS TO RUN
. . . LAST LONGER, TOO!**

Enter 1055 on Reader Card



Basic "T" section design shows "backbone" construction that insures positive roller guidance and stability without skewing under all load conditions.



For roller stability... *there's nothing like* *"the bearing with the backbone"*

The only *positive* way to guide rollers is by an integral center guide flange—backbone of the Torrington Spherical Roller Bearing. No floating ring can match it for stability under heavy radial and thrust loads.

This "bearing with the backbone" insures true rolling motion . . . prevents stress concentration . . . means minimum friction. It makes possible open-end cage design, too, with no shrouds to impede circulation of lubricant to bearing contact surfaces. There is less heating and more positive lubrication.

The integral center guide flange is adapted from the same principle used in the design of Torrington Tapered Roller Bearings. This refinement is typical of Torrington's uncompromising engineering that assures you the ultimate in bearing performance. **The Torrington Company, South Bend 21, Ind.—and Torrington, Conn.**

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • NEEDLE • BALL • NEEDLE ROLLERS • THRUST
Enter 1004 on Reader Card



Washington Letter

Edgar Poe

More Mortgage Money

Applications for FHA and VA-insured mortgages rose sharply during the late spring and early days of summer. More mortgage money became available. The trend toward easier money appears likely to continue indefinitely. Congressional approval of an additional \$1 billion of authorized FHA mortgages has been a real shot in the arm for the home building industry.

Congressional approval of the two-year extension of World War II GI Housing program until July 1, 1960, has given the VA program new impetus. However, housing officials agree that the GI housing starts in the months ahead cannot expect to approach the level of VA housing in the boom years of 1954 and 1955 when there were 307,000 and 393,000 starts respectively.

In the closing weeks of the session, House and Senate committees worked on the omnibus housing legislation that is expected to be a marked stimulant to home building. The Senate measure calls for \$400 million worth of housing units on campuses of colleges and universities in preparation for the big influx during the next five years. The measure also provides for 35,000 public housing units. Another provision increases the limit of FHA-insured mortgages from \$20,000 to \$22,500 per unit.

SBA eyes Defense Contracts

Small businesses, including many in the rock products and the nonmetallic fields, are likely to get a larger percentage share of the \$23 billion of Defense Department contracts that will be awarded during the 1959 fiscal year than small business had gotten in the past. The Small Business Administration has established an "office" at the Pentagon. However, negotiations for small business is just as tough as with the large companies.

Of the \$23 billion in defense contracts, con-

struction plans call for an outlay of \$2.2 billion. A tremendous amount of cement, steel, lumber and other building materials will be consumed. Once there was difficulty in interesting private concerns to bid on many of the contracts—the biggest of which comes under procurement—but now it is different.

Unloading Fee under Scrutiny

Fee collecting by the Teamsters Union for the unloading of trucks would be stamped out under a proposal by Senator Strom Thurmond of South Carolina. The measure would be a part of a new labor-management reporting and disclosure bill. Union locals in numerous cities impose a fee on truck drivers. Actually, it amounts to higher prices paid by the shippers and consumers.

Tax Relief in offing?

In the closing weeks of the 1958 session, Congress heard over and over that industry must obtain a tax break or there will be more and more mergers. Chairman Wilbur Mills of the House Ways and Means Committee expresses confidence that something will be done about the tax structure next year so industry can buy new machinery and renew equipment.

Numerous congressmen lash out at big business and business mergers, when at the same time they support measures responsible for mergers. If industries like cement, for instance, were permitted to take plant depreciation equivalent to replacement costs rather than the original costs, it would permit them to replace worn out and inefficient machinery as well as to provide for expansion.

Rules on Hot cargo Clauses

In a ruling of interest to rock products industries, the Supreme Court has held that a so-called hot cargo clause in a labor-management agreement does not protect a union against a secondary boycott charge. Dividing six-

to-three, the tribunal's controlling decision declares that hot cargo contracts are unenforceable. Workers whose contracts contain hot cargo clauses have been allowed in the past to refuse to handle shipments from what they regard as an "unfair" shipper. The Taft-Hartley law forbids union pressure on a second employer to force him not to do business with an employer with whom the union is quarreling.

The Interstate Commerce Commission in 1957 ruled that common carriers who inserted hot cargo provisions in their labor contracts as reasons not to handle goods and materials of a particular shipper were jeopardizing their operating permits.

**Question
And
Answer**

One of the Department of Justice's top experts on anti-trust legislation was asked a few weeks ago at a small dinner why the department was so quick to oppose the merger of two steel companies, but remained silent against the AFL-CIO merger. The attorney said very simply and to the point that Congress has seen fit to exempt labor unions from anti-trust laws. Therefore, unless Congress moves to put the unions under the anti-trust laws there is nothing the department can do about it.

**Highways—
Market for
Lime**

Highway construction still provides a smaller market for lime than any of the other major users such as steel, pulp and paper, chemicals, plaster and glass, but increased use of lime on a big scale appears now to be not far away. The Bureau of Public Roads and highways officials say that the value of lime for stabilization is just beginning to be recognized and appreciated. Qualified observers are predicting that the highway market is destined to become one of the foremost users of lime. Shortages of good road materials in many sections of the country are growing. Supplies of good material have become depleted, and transportation costs are prohibitive when suitable base and sub-base materials are moved a great distance.

Therefore, BPR officials say there is evidence there will be increased use of lime as an additive. Maj. Gen. Louis W. Prentiss, executive vice president of the American Road Builders Association, says the greatest future use of lime in the highway program lies in the secondary road system. Of the 3,400,000 miles of roads, streets and highways in the United States, 750,000 miles are in

the federal-aid system and two-thirds of this mileage, or 500,000 miles, make up the secondary system. In addition most states have thousands of miles of so-called farm-to-market roads not in the federal-aid system.

Speaking before the National Lime Association, General Prentiss said federal and state funds amounting to nearly \$5.8 billion will be made available for secondary roads during the 1960-69 period. Therefore, he declared this program offers a potentially big market for lime as an additive to submarginal material.

**Court
Reverses
ICC order**

The Supreme Court of the United States has taken cognizance of the powers of the states in intrastate transportation cases this year, and has curbed some of the powers of the Interstate Commerce Commission. In a Utah rail freight case, the ICC ordered a 15-percent rise in intrastate charges to bring them up to the interstate level. The high court, in reversing the ICC, said the regulatory agency failed to make a thorough study of intrastate traffic costs which might even justify lower rates.

**Freight
Tax
Repeal**

Repeal of the wartime-imposed three percent federal excise tax on freight transportation, the only significant tax cut of the year, means a \$500-million loss to the Treasury. The tax applies for all so-called for-hire carriers, including railroads, trucks and planes. It does not apply to private carriers, who did not have to pay the tax anyway. Private carriers have been taking away much of the business from for-hire carriers. Repeal will particularly help the overly regulated, economically pinched railroads.

**Channeling
Old Man
River**

The Army Engineers are supervising one of the most interesting engineering projects ever undertaken in the Lower Mississippi Valley. Thousands of tons of concrete and steel are being devoted to two huge structures designed to keep the Mississippi River from changing its course above Baton Rouge and taking a short cut to the Gulf of Mexico, thus leaving Baton Rouge and New Orleans on a salt water lagoon. The engineers are spending \$80 million on the massive concrete and steel structures.

END



BIG PROJECTS PROVE IT!

Firestones deliver lowest cost-per-hour service!

From the New York Thruway to Montana's Hungry Horse Dam, contractors using Firestone off-the-highway tires are making new records for long hours of tire service and slashing tire maintenance costs. One big reason is new Firestone Rubber-X—the longest wearing rubber ever used in construction equipment tires.

Another reason is because the combination of Firestone Rubber-X with exclusive Firestone S/F (Shock-Fortified) nylon cord body gives you the strongest, most serviceable off-the-highway tire built today—a tire that beats downtime resulting from rapid wear, cuts, snags and impact breaks—a tire that keeps your equipment rolling on the toughest haul or on the tightest schedule.

See your Firestone Dealer or Store and ask the Firestone Tire Expert how Firestone tubeless or tubed nylon off-the-highway tires can cut your tire costs. When you order new off-the-highway equipment, always specify Firestone tires.

Firestone

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The Firestone Tire & Rubber Company **BETTER RUBBER FROM START TO FINISH**



FIRESTONE ON-THE-JOB SERVICE—Unmatched Firestone off-the-highway tire service cuts costs, keeps equipment rolling to keep all jobs on schedule.



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ROCK GRIP WIDE BASE® **ROCK GRIP®**

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How would you decide?

A round-up of actual day-to-day in-plant problems and how they were handled by management men

Must employees be given holiday pay if laid off the day before?

What Happened:

THE COMPANY RULE required that employees work the day before a holiday in order to get holiday pay. The men were looking forward to a holiday week because it was a short week with a full week's pay. Un-

fortunately, a big order was suddenly cancelled and the employer had to announce a lay-off beginning the day before the holiday and lasting for a couple of weeks. When the pay checks for the period were distributed, the workers found much to their dismay that they weren't paid for the holi-

day. When the employer pointed out the rule about working the day before a holiday in order to be eligible for holiday pay, the employees replied that they were ready, willing and able to work that day and that the lay-off was no fault of theirs. They took the grievance to arbitration.



fortunately, a big order was suddenly cancelled and the employer had to announce a lay-off beginning the day before the holiday and lasting for a couple of weeks. When the pay checks for the period were distributed, the workers found much to their dismay that they weren't paid for the holi-

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to Rock Products.

Were the workers:
Right? ☐ Wrong? ☐

What Arbitrator Runnells ruled:

"The rule that employees must work the day before and the day after a holiday is commonly employed in American industry. Its purpose is to dissuade employees from extending a holiday period and making it difficult or impossible for the employer to schedule and carry on his business. In this case the employees were, to all intents and

purposes, available and willing to work the required day. All employees who were on the payroll and normally scheduled to work the day preceding the holiday should receive pay for the holiday."

When can't you fire an employee for falsifying his job application?

What Happened:

THE COMPANY HAD A VERY strict rule—any employee who falsified his application blank was subject to dismissal. When Harry V. applied for a job, he admitted on the application form that he had been arrested once for "drinking." He got the job. Five years later, in a routine investigation of Harry V. relative to a compensation case, the company discovered that he had a record of 12 arrests. He was fired, but filed a protest.

Was Harry:
Right? ☐ Wrong? ☐

What the Arbitration board ruled:

"The present consensus of arbitrators appears to be that, after a lapse of some reasonable period of time, falsification of an application for employment should not operate as a complete and sufficient cause for discharge, but should be considered in light of the total circumstances. To allow even substantial false statements in applications to be used forever as absolute and complete cause for discharge is to prevent an employee from reforming his life and from building better than he may have built before. Harry V. is to be reinstated."

(Continued on page 32)



G-E SYSTEM ENGINEERING assistance helped reduce construction time and costs on Permanente Cement Co. plant expansion.

AT PERMANENTE CEMENT CO., G-E EQUIPMENT HELPS . . .

Boost Plant Capacity 1,500,000 bbls./year

The addition of a sixth kiln and three new ball mills at Permanente Cement Company's huge Permanente, California, plant boosted output by 1,500,000 barrels per year. This expansion, necessitated by increased demands from the Company's western states and Pacific islands market brings plant capacity to 8,500,000 barrels per year.

Engineering responsibility for the expansion lay with Kaiser Engineers. Working together with General Electric Application Engineers on a coordinated system basis, they utilized the latest engineering techniques to obtain optimum performance at reduced cost and construction time.

To achieve maximum savings on your plant expansion program, call on General Electric early in your planning stage. Your nearby G-E sales engineer will be happy to assist you, anytime. General Electric Company, Schenectady 5, New York.

656-22



NEW BALL MILLS at Permanente Plant are powered by heavy-duty General Electric synchronous motors. Speed-torque characteristics of this 1000-hp motor are matched to the mill to give more dependable starting under specific power system conditions at this plant. G-E motor design provides reliable performance, maximum safety and ease of maintenance.

INDIVIDUAL FIELD EXCITATION for existing and new synchronous ball mill drives is supplied by efficient G-E motor-generator sets. Triple-protected Tri-Clad® motors, combined with job-matched d-c generators provide a more economical, faster-responding power source.



Engineered Electrical Systems for the Cement Industry

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G-E MOTOR CONTROL CENTER (r.) centralizes operation of precipitator and auxiliary motors for greater convenience and safety. Limitamp® 2300-v controllers (l.) are for induced draft fan motor and for transformer supplying 480-v power to motor-control center.

* Registered Trade-mark of General Electric Co.



LABOR RELATIONS

(Continued from page 30)

When can't you discipline an employee for being insubordinate?



What Happened:

AUSTIN REED worked on a production line. His job was to "bind" molds as they came out of castings. One day the general foreman came over to Reed and ordered him to "rake sand off each mold." Reed refused, saying it was not his job. In anger, the foreman said, "Are you going to quit?" Reed answered, "No, I'm not going to quit and I'm not going to do anything that's not my job, either!"

Reed was fired for insubordination. When the case came to arbitration, the company argued:

1. Even if an order is improper, the employee must obey and seek redress only through the grievance machinery.
2. The company has a right to direct its workforce without arguments from employees.

The union's answer was:

1. The foreman's order was im-

proper and illegitimate, and therefore could be refused.

2. The company has a right to direct its workforce, but only within the framework of the contract, and cannot order a man to work outside his classification.

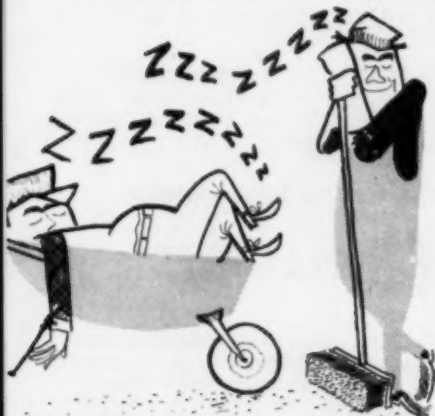
Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Williams ruled:

"Insubordination is the refusal of an employee to carry out a legitimate, proper order of management. The employer-employee relationship requires the employee to subordinate himself to the commands of his employer insofar as those commands and orders are proper. But an employer has no right to order an employee to do ANY AND EVERY task. Management's orders are confined within the bounds of propriety. The order directed toward the grievant was improper and erroneous. To uphold the company's action and condone the discharge would be condoning an error. To say that any employee, when told by the company to do ANY task, must comply or face possible discharge for insubordination, seeking redress only through subsequent appeal to the grievance procedure, would render meaningless the Agreement itself. Surely the company can direct the working force, but its direction must be just and proper and within the scope of the employee's job. Reed is hereby reinstated with full job rights and back pay."

Can you base disciplinary action on the word of an unnamed accuser?



What Happened:

TWO EMPLOYEES RECEIVED written reprimands for sleeping on the job. When the employees questioned the company's basis for such action, they were told that it was based on information received by telephone from

one of its employees. It refused to name the informant or specify when the offense had occurred. The men challenged the company's right to reprimand them on such evidence, and took their case to arbitration where they argued:

1. They had no opportunity to prove that the informant was lying or misinformed.
2. The reprimands based on such evidence should be taken from personnel files and destroyed.

The company replied:

1. The employees had no right to challenge the reprimands and bring the matter to arbitration unless (or until) the reprimands were used as a basis for disciplinary action.
2. To reveal the name or names of informants would dry up its sources of information among conscientious employees.

Was the company:

Right? ☐ Wrong? ☐

What Arbitrator Scheiber ruled:

"The livelihood of a worker should not be placed at the mercy of an informer who is immune from testifying under oath at an arbitration proceeding and submitting to cross-examination. The basic concept of our system of jurisprudence is that one accused shall be presumed innocent until proven guilty by competent evidence. Mere accusations and unsupported charges are not evidence.

"While the company cannot be required to remove the reprimands from the employees' records and destroy them as requested, it may not use these reprimands as the basis for future disciplinary action. There is no merit to the company's contention that the men have no right to challenge the reprimands until they have been used against them. A reprimand is a step in the disciplinary procedure and, as with other disciplinary action, must be supported by competent evidence."

END



STATIONARY PLANTS



How Diamond put a gravel deposit in business

Check This Layout

- a trap loading hopper equipped with a grizzly and plate feeder
- three 24" lattice framed belt conveyors
- 2 wash boxes
- a 3 deck and a 2 deck water screen equipped with spray bars
- a screw washer
- a 10"x36" jaw crusher
- a 30"x20" roll crusher
- a 24" DorrClone
- 4 portable stockpiling conveyors

Diamond makes everything for the aggregate producer:

Jaw Crushers • Roll Crushers • Conveyors • Screens and Washers • Feeders and Bins • Portable and Stationary Crushing Plants for Rock and Gravel.

The owner of a Northern Illinois gravel deposit had a problem. A ready market existed for finished aggregate products that could meet the rigid specifications of state and local highway programs. Could such materials be produced from his property in adequate quantity . . . and at a profit. He turned to Diamond . . . today he has a profitable operation.

Experienced engineers surveyed the site, checked the type of material in the pit, verified the finished products wanted, and determined the production capacity that would be needed. Then they submitted detailed sketches, specifications and costs for a complete plant layout. Approval was received and in a matter of weeks another Diamond engineered and built plant was making money for its owner.

Arranged in a space-conserving layout, the plant is producing four profitable materials at the rate of 70 to 150 cu. yds. per hour, depending upon the amount of each product desired; washed concrete sand, washed natural gravel in two sizes ($1\frac{1}{4}"$ to $\frac{1}{2}"$ and $\frac{1}{2}"$ to #4 mesh), and 100% crushed, screened and washed gravel in either 1" to #10 mesh or $\frac{3}{8}"$ to #10 mesh. All meet state, county and township road specifications.

The entire plant is electrically driven with all wiring underground. It requires a minimum of supervision with one man handling the operation . . . typical of Diamond's thoroughness and ability to provide the best knowhow and equipment for any size job. It's a good example of how Diamond can tie-up high capacity, smooth operation and low production costs in one neat profit package for you. See your Diamond Distributor today.

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DIVISION

GOODMAN MANUFACTURING COMPANY

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ROCK PRODUCTS, August, 1958

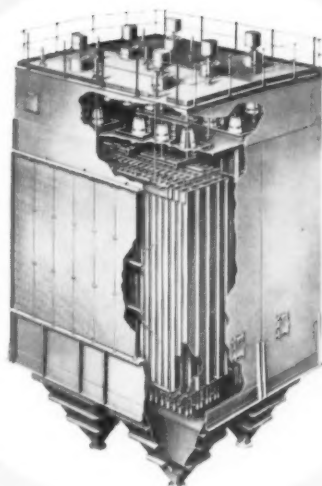
Research-Cottrell

*makes
all
three*

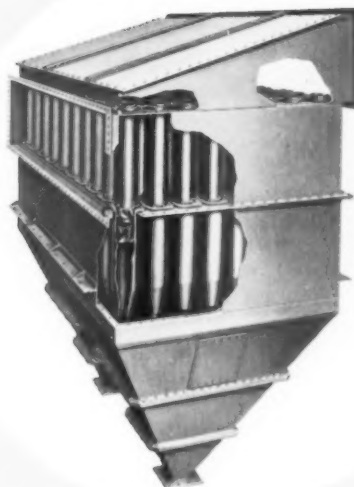
All three Research-Cottrell dust collectors are engineered for specific cement dust applications. Research's experience as the world's largest manufacturer of precipitators is well known—over 2000 installations in many different industries • In addition to straight precipitators, Research-Cottrell also offers electrical-mechanical combination units and Cyclo-trell mechanical collectors. Cyclo-trells are available in both 10-inch and 24-inch tube sizes. For more information on Research-Cottrell's line of dust collecting equipment which has been engineered for the cement industry, write for Bulletin PC.

Research-Cottrell

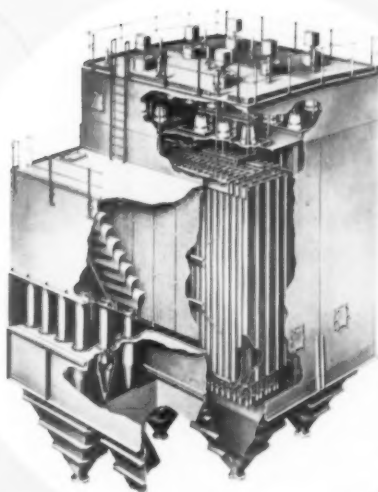
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**Cottrell
Precipitators**



**Cyclo-trell
Mechanical Collectors**

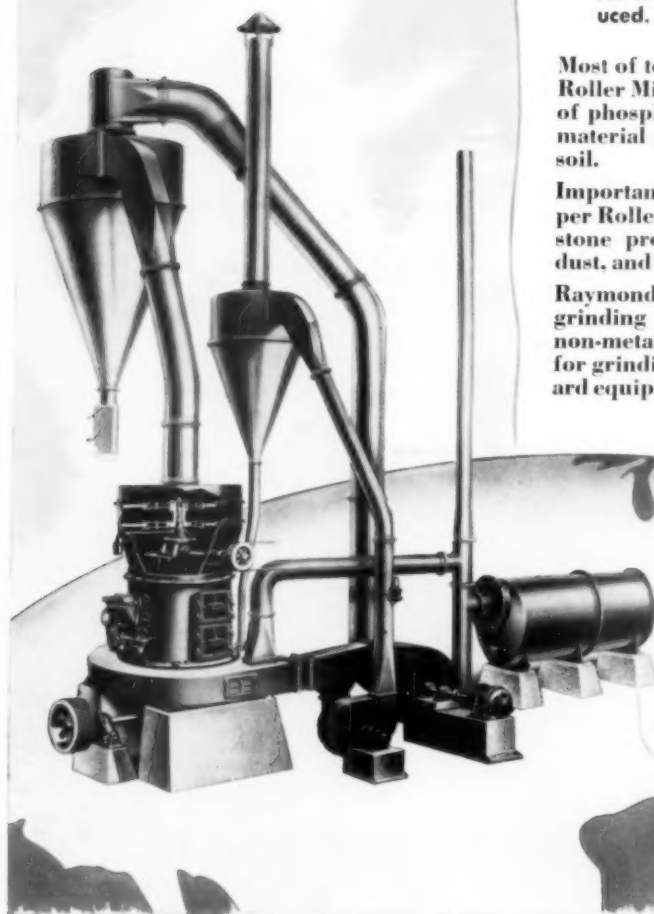


**Combination
Electrical-Mechanical
Collectors**

RAYMOND

ROLLER MILLS

**In World-Wide Use
for Half a Century**



THE standardized use of Raymond Roller Mills in so many industries comes as a natural result of these advantages:

1. Ability to pulverize an extremely wide range of products and to handle various types of raw materials from mines, pits, quarries and bed deposits in all parts of the world.
2. Removal of surface moisture from the material while grinding to insure a fine, dry, free-flowing product.
3. Automatic dust-free operation with record low costs for maintenance and power per ton material produced.

Most of today's gypsum grinding is done on Raymond Roller Mills. They are also used on all types of deposits of phosphate rock, the world over, in producing fine material for acidulation or direct application to the soil.

Important economies are shown by the Raymond Super Roller Mills in pulverizing large capacities of limestone products: fine agstone, mineral fillers, mine dust, and fine chemical lime.

Raymond Roller Mills are in preponderant use for grinding clays, kaolin, bentonite, barytes and other non-metallic minerals. They are also specially adapted for grinding sulphur, and they have become the standard equipment in this field.

If you have a grinding problem—let Raymond engineers help you.
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PEOPLE

IN THE NEWS

Dravo technical papers awards announced



Berry Lorkin Price

W. L. PRICE, engineering manager of the Keystone division of Dravo Corp., Pittsburgh, Pa., received third prize of \$200 in Dravo Corp.'s 19th Annual Technical Papers Competition, for his paper on "Current Developments in Gravel Beneficiation."

Mr. Price is a four-time winner in this competition. His paper was presented before the American Mining Congress, National Sand and Gravel Association convention in Chicago in February, and the American Institute of Mechanical Engineers. It was published in the November, 1957, edition of the *Mining Congress Journal* and will be published in booklet form by the NSGA.

Other prize winners in this competition include F. J. Larkin, plant and research engineer, contracting division, who received first prize of \$500, and T. M. Berry, superintendent of construction, contracting division, who received \$100.

Harry T. Campbell elects new officers

BRUCE S. CAMPBELL, JR., has been elected president of Harry T. Campbell Sons' Corp., Towson, Md. He succeeds his father, Bruce S. Campbell, who has been named chairman of the board. H. Guy Campbell, executive vice president, has been elected vice chairman of the board.

Robert F. Porter, formerly vice president in charge of concrete and building materials sales, has been named vice president of materials sales, and Albert S. Cummins, vice president of the Sakrete division. R. McLean Campbell, formerly assistant secretary

and assistant treasurer, has been appointed secretary, and Florence C. Russell has been made assistant secretary and assistant treasurer. Mr. Porter and Mr. Cummins also have been appointed members of the management committee.

Harry G. Campbell, Jr., and Richard L. Campbell, have been re-elected vice presidents; S. James Campbell, treasurer; and Fred Brandt, assistant secretary and assistant treasurer.

Harley Lee receives award



HARLEY C. LEE, vice president and director of Basic, Inc., Cleveland, Ohio, was recently awarded the Benjamin G. Lamme Medal of Ohio State University in recognition of "meritorious achievement in engineering." Widely recognized for his pioneering research and development work in the field of basic refractories, Mr. Lee served part-time as a research chemist with Basic Dolomite, Inc. After graduation from Ohio State University in 1927, he joined the firm on a full-time basis, subsequently becoming director of research and later vice president and technical director.

National Gypsum director

H. G. LORD has been appointed technical director of the commercial trade sales division of National Gypsum Co., Buffalo, N.Y. He has been with the company since 1935.

C. L. Rudd named sales manager

CLARENCE L. RUDD has been appointed sales manager of the Janesville Sand & Gravel Co., Janesville, Wis. He joined the firm in 1956 as sales engineer and was appointed acting sales manager in 1957, upon the death of John D. Husen. A native of Texas, Mr. Rudd received his B.S. degree in mechanical engineering from the University of Wisconsin, Madison, Wis.

Ellis E. Jensen has been re-elected president of the company; George Meyer, vice president; G. Roy Jensen, vice president in charge of sand and gravel operations; Gerald C. Condon, secretary-treasurer; and Donald Glynn, assistant secretary and treasurer.

Eagle-Picher superintendent

RALPH W. YOCUM has been appointed plant superintendent of the new Lovelock, Nev., diatomaceous earth plant of Eagle-Picher Co., Joplin, Mo. He formerly served at the diatomaceous earth plant of Great Lakes Carbon Corp., Lompoc, Calif. John W. Kenney, Jr., general works manager, is supervisor of both the Lovelock and Clark Station plants.

American Cement officers



JOHN H. ASMANN, above, has been elected vice president and treasurer of American Cement Corp., Philadelphia, Pa., and L. L. Conley, sales manager of the Riverside division, has been named vice president of sales for the division.

(Continued on page 42)

"With our TD-24 we are pushing 40-ton rock slabs—dozing and ripping at a 50% better rate than with our other big tractor," states Owner L. J. Luttjohann. He removes a 24-inch-thick hard rock stratum; rips and dozes-off a soft rock layer with his "24" to uncover high-grade limestone deposits.

How Planet Power- Steered TD-24 outproduces clutch-steered competitor by an amazing 50%



States Operator Alvin Hanson "This new TD-24 Torque Converter is great for my ego. The other dozer's operator works harder, but I move at least one-half more material per day than he will!"



...stripping for Luttjohann Stone Co.,

Dozing 40-ton chunks of stone aside—ripping worthless rock layers into movable spoil—this Planet Power-steered TD-24 is outproducing its 20-ton steering-clutch-steered competitor, by the amazing margin of 50%!

Both crawlers are working under identical conditions. Both are ripping and stripping overburden for the Luttjohann Stone Co., near Topeka, Kansas.

The decisive difference is: the TD-24 has "live" power on both tracks all the



overburden!

Topeka, Kansas

time. Planet Power steering eliminates load-limiting "dead-track drag." You don't "half-kill" your power and traction to guide the TD-24—as you must with any king-sized steering-clutch tractor. You can even "equalize" TD-24 track speed to steer accurately with big offset loads!

Both king-sized crawlers cost approximately the same to buy and operate. But the TD-24 Torque-Converter does half-again as much as the other rig!

Prove to yourself what a tremendous profit-earning advantage the Planet Power-steered TD-24 gives you over anything else on tracks. Compare the huge capacity increase Planet Power steering delivers on benching, whether on turns or straightaway. Add up the extra 'dozing passes you get per day from exclusive Hi-Lo shifting—and from high TD-24 reverse speeds. Ask your International Construction Equipment Distributor for your demonstration!



***International
Construction
Equipment***

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

FACES AND PLACES

... Candid shots of people in the



They were working in the quarry

About the time "I've been workin' on the railroad" was a popular song, these men, too, knew hard work—in the limestone quarry of Elmhurst-Chicago Stone Co. Celebrating its 75th anniversary, the Illinois company is looking back over its years of growth. This picture was taken in 1894, when the firm was comprised of these 30 officers and employees



Company founder

Adolph Hammerschmidt, grandfather of present heads of Elmhurst-Chicago Stone Co., founded the company with Henry Assman in 1883. Ten years later he bought out his partner's interest in the company

Talk over old times—and new

An interested listener as Nathan C. Rockwood, center, editor emeritus of ROCK PRODUCTS, talks over old times and new with George Hammerschmidt, Sr., right, president of Elmhurst-Chicago Stone Co., is Mr. Rockwood's son, Alec. The Rockwoods were among the thousand guests who joined the company in celebrating its anniversary at an all-day outing at Woodridge Golf Club



Comes by it naturally

Truman A. Dunn's proficiency around machinery can be laid to years of experience, but much of it is inborn. Seeing him supervise Standard Slag Co.'s Massillon, Ohio, sand and gravel plant, it's easy to mark the resemblance in ingenuity and energy between him and his father, Felix A. Dunn, a pioneer in the Indiana limestone industry

rock products industry

Steady as she goes

Charles Ogle, right, plant superintendent of the Rockwood, Tenn., plant of Lambert Bros. Division of Vulcan Materials Co., was so busy getting a new motor in place for a crusher he didn't have time to look up to get his picture taken. Standing by is Clarence Robinson, chief electrician



Convention pow-wow

Small groups like this formed the basis for exchange of information and shop-talk between sessions at the recent meeting of Indiana Mineral Aggregates Association. From left are Maynard C. Yoder, Elkhart; Charles H. Purdum, Jr., Syracuse; Oscar Burtzner, Auburn and Don C. Brudi, Fort Wayne



Make hay while sun shines

Delayed by wet weather, the construction schedule of Mississippi Valley Portland Cement Co.'s new plant at Redwood, Miss., was pushed ahead with all speed when the skies cleared. Deep in conversation aimed at getting the plant ready for its scheduled opening in early fall were Henry V. Allen, Jr., left, executive vice president, and L. A. Gorgin, construction superintendent



Precautionary check

The Lake Ontario Portland Cement Co.'s plant at Picton, Ontario, is brand new and efficient, and it is W. C. Durie's job, as plant engineer, to keep things running smoothly. Routine checks on the mechanical operation of equipment are carried out faithfully; here he checks the belt scales on raw rock conveyor

PEOPLE IN THE NEWS

(Continued from page 37)

Thomas Ware heads IMCC

THOMAS M. WARE has been elected president of International Minerals & Chemical Corp., Chicago, Ill., succeeding his father, Louis Ware, who has been named chairman of the board and chief executive officer.

An engineering graduate of Cornell University, Ithaca, N.Y., Thomas Ware joined IMCC in 1947 as an industrial engineer, and for the next five years served as chief engineer, directing construction of new plant facilities and installations. Named vice president of engineering, he planned, coordinated and directed a program of streamlining operations in the company's 72 mines and plants. Mr. Ware has been administrative vice president since 1955, was elected to the board of directors in 1957, and has had the additional responsibilities of the executive vice president since the retirement of James P. Margeson in 1957.

Mr. Ware is internationally known in mining circles. Last year, he spoke at an international mining conference in Paris, and in February he was one of the speakers at the AIME meeting in New York.

J. E. Gray appointed ASTM representative

J. E. GRAY, engineering director, National Crushed Stone Association, has been appointed to represent Subcommittee C-10 of ASTM's Committee D-4 on a joint committee of the Asphalt Institute, American Association of State Highway Officials, and American Society for Testing Materials. This joint committee has been established to unify specifications for hot-mix, hot-laid bituminous concrete.

Otto Cheska named general manager for Consumers Co.

OTTO A. CHESKA was recently appointed to the newly created position of general manager of the Wisconsin and Illinois operations of Consumers Co., Chicago, Ill., a division of Vulcan Materials Co., and will be responsible for planning, controlling, coordinating and managing all plants and all plant related functions of the company.

In January of this year, Vulcan Materials Co. acquired by merger Union Chemical & Materials Corp., of which Consumers Co. has been a division for a number of years, Lambert Bros., Inc., and, in addition, acquired all of the stock of Asphalt Paving Materials

Co., Brooks Sand & Gravel Co., Chattanooga Rock Products Co., Rockwood Slag Products, Inc., Tennessee Equipment Co., Wesco Contracting Co., and Wesco Materials, Inc. After this merger, Mr. Cheska was elected to the board of directors of Vulcan Materials Co., a position he now holds.

Universal sales manager



WILLIAM W. BURNHAM has been appointed sales manager of the Philadelphia sales territory of Universal Atlas Cement Co., New York, N.Y. He succeeds Robert E. Fulton who has retired after 32 years of service. A native of Kansas City, Mo., Mr. Burnham attended State Teachers College, Warrensburg, Mo., and the University of Notre Dame, South Bend, Ind. He joined the Des Moines sales office of Universal Atlas in 1947 as a sales trainee and, after serving in the Kansas City and Dayton offices, became assistant sales manager at Philadelphia in 1956.

Mr. Fulton was born in Dixon, Ill., and graduated from the University of Illinois. He joined Universal Atlas as a salesman at Chicago in 1926, and four years later was assigned to Birmingham, Ala. He became assistant sales manager in 1938, sales manager at Des Moines in 1939, assistant sales manager at Philadelphia in 1945, and sales manager in 1946.

Saskatchewan director

W. J. PATTERSON has been elected a director of the Saskatchewan Cement Co. Ltd., Regina, Saskatchewan, Canada, according to an announcement by W. S. Ziegler, president. Mr. Patterson has been Provincial Treasurer and Premier of the Province of Saskatchewan. He was, until recently, Lieutenant-Governor for the Province.

Agstone Division officers

FRED E. ROBERTS, president, Evans-Roberts, Inc., Norristown, Pa., was elected chairman of the Agricultural Limestone Division of the Pennsylvania Stone Producers Association, Harrisburg, Pa., at a recent meeting of the Division. Dorr Stock, Jr., Faylor Lime & Stone Co., Winfield, was elected vice chairman; H. M. Binkley, Binkley & Ober, Inc., East Petersburg, treasurer; and H. H. Wagner, general manager of the Pennsylvania Stone Producers Assn., secretary.

Members of the board of directors for the Eastern Section are Walter Hamme, National Gypsum Co., York, Pa., and H. H. Snyder, Eastern Lime Corp., Kutztown; Central Section, W. O. Faylor, Faylor Lime & Stone Co., and Henry Hunsberger, Fry Coal & Stone Co., Mercersburg; Western Section, Robert Hammett, The Carbon Limestone Co., Lowellville, Ohio, and Elmer A. Snyder, Allegheny Mineral Corp., Cowansville, Pa.

Kaiser vice presidents

DONALD C. TRETZEL, works manager, and D. G. Farquharson, administrative manager, have been elected vice presidents of Kaiser Bauxite Co., wholly owned subsidiary of Kaiser Aluminum & Chemical Corp. operating bauxite mining, processing and shipping facilities on Jamaica, B.W.I. Both Mr. Tretzel, who has been connected with quarrying and mining operations in the Kaiser organization for more than 28 years, and Mr. Farquharson have been associated with the development of Jamaican bauxite operations since 1951.

U. S. Gypsum managers

FRANK M. BELL has been named field marketing manager of insulation products for United States Gypsum Co., Chicago, Ill. Formerly district manager in the Harrisburg, Cleveland and Detroit offices, he replaces W. D. Alseth, who is now Omaha district manager.

Member of Young Presidents

RICHARD K. HUMPHRIES, president of Pacific Cement & Aggregates, Inc., San Francisco, Calif., has been elected a member of the northern California chapter of the Young Presidents Organization. Qualifications for membership include becoming president of a corporation with a gross sales of more than \$1,000,000 per year before reaching 40 years of age.

(Continued on page 41)



"On-the-job versatility has made my 4-In-1 so popular that mine operators demand it to do their jobs," reports Mr. Reed. "Ordinarily in mine opening operations, two machines are needed—an excavator-loader and a 'dozer. The 4-In-1 is both!" Larger view shows his 4-In-1 building a haul road as a 'dozer. Smaller photo shows it opening up a drift mouth using Skid-Shovel action.



How a 4-in-1 grabs jobs from limited-duty rigs *...works where others can't!*

Instead of doing high-priced "piece work" with several single-job machines, D. M. Reed, Langley, Kentucky, does an amazing variety of specialized operations with one cost-cutting machine: an International Drott TD-14 4-In-1! His coal mine operator customers demand the 4-In-1's services for opening drift mouths, building haul roads, excavating and grading, doing drainage and tipple maintenance work—and other multiple-operation jobs. Result: Contractor Reed often has two other unemployed crawler dozers, as the 4-In-1 goes profitably on its job-taking, money-making way!

See for yourself how an International Drott 4-In-1 cuts your equipment investment, reduces labor and operating expense, and multiplies your profit range by four! Just move the "machine-selector" lever—try the built-in clamshell, "carry-type scraper," bulldozer, and Skid-Shovel actions. Also, measure the exclusive advantages of shock-swallowing Hydro-Spring, to increase capacity, reduce downtime. Ask your International Drott Distributor for a 4-In-1 demonstration.



"The 4-In-1's clamshell action is a real time-saver," adds Mr. Reed. "With bottom-dumping it will discharge even the wettest, stickiest material cleanly!" Here, the outfit proves bottom-dumping advantages, handling wet clay spoil that would stop ordinary buckets "cold!"

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin



INTERNATIONAL®

DROTT®

PEOPLE IN THE NEWS

(Continued from page 42)



Penn-Dixie chemist retires

CARL L. PHILLIPS has retired as chief chemist of the Petoskey, Mich., plant of Penn-Dixie Cement Corp., New York, N.Y., after 42 years in the cement industry. A native of Newaygo, Mich., Mr. Phillips attended McLachlan University, Grand Rapids, Mich. He started his career in the cement industry in 1916 as mix chemist with the Newaygo Portland Cement Co., Newaygo, Mich. He became chief chemist of the Petoskey Portland Cement Co. when it was organized and started operations in 1921. He continued in this position when Penn-Dixie Cement Corp. purchased Petoskey in 1955.

Sales supervisors named by Bestwall Certain-teed

THREE SALES PERSONNEL changes have been announced by Bestwall Certain-teed Sales Corp.

C. J. Lundblad has been appointed Philadelphia District sales supervisor, with headquarters in the district sales office at Wilmington, Delaware.

R. W. Miltz has been named sales supervisor of the Cleveland District, and S. H. Bundy was appointed sales supervisor of the Dallas District.

Mr. Lundblad has had more than 25 years of experience with the company. During the past few years he has been merchandise manager of Certain-teed's Insulation Division.

Mr. Miltz was formerly Cleveland District roofing supervisor. Mr. Bundy has been with Certain-teed since 1945 as salesman in the company's Wichita, Kansas, territory.

Bestwall Certain-teed is sales organization for Bestwall Gypsum Co. and Certain-teed Products Corp.

PCA paving engineer

WALTER C. ORAM has been appointed paving engineer of the Rocky Mountain regional office of the Portland Cement Association, Chicago, Ill. He joined PCA in 1952 as special assignment engineer in the highways and municipal bureau. Since 1955, he has served as general field engineer at the Seattle district office. Mr. Oram received undergraduate engineering training at Northwestern University, Evanston, Ill., and the University of Chicago, Chicago, Ill., and holds a B.S. degree in civil engineering from the University of Washington, Seattle.

Assistant development manager named

FREDERICK E. HAWKINS has been named assistant development manager of Keasbey & Mattison Co., Ambler, Pa. A graduate of Cornell University, Ithaca, N.Y., with degrees in chemical engineering, and a member of the American Institute of Chemists, Mr. Hawkins was associated with the research and development division of the National Dairy Products Corp. prior to joining the research staff of Keasbey & Mattison.

Alpha sales representatives

LOUIS M. MUHLHOFER has joined the Ironton, Ohio, sales force of Alpha Portland Cement Co., Easton, Pa.,

and will cover southwestern Ohio and northern Kentucky. A native of Cincinnati, Mr. Muhlhofer attended Miami University, Oxford, and the University of Cincinnati. He was formerly with Sakrete, Inc.

Robert C. Jordan has joined the Birmingham, Ala., office as sales representative in northern Alabama. He is a native of Birmingham and a graduate of Alabama Polytechnic Institute, Auburn.

Honored by Thailand

ERIK THUNE, chairman and president of National Portland Cement Co., has been appointed commander of the Most Exalted Order of the White Elephant by the king of Thailand. Mr. Thune was honored for his work with the Siamese cement industry.

Stone firm promotes three

KENTUCKY STONE CO. has promoted R. E. DeZonia from sales manager to vice president in charge of sales. Ray Vencill was promoted from superintendent of western operations to vice president in charge of western operations and W. T. Brooks from vice president and secretary to vice president and treasurer.

Harvey Scribner, Jr., of the firm's accounting department, replaces Mr. Brooks as secretary. Verne C. Morgan, former treasurer, has retired.

END

OBITUARIES

Christian B. Geiger, superintendent of Marble Cliff Quarries Co., Columbus, Ohio, for 34 years, passed away May 29. He was 77 years old.

George N. Ivin, chief chemist for Northwestern States Portland Cement Co., Mason City, Iowa, died May 13 following a short illness. He was 65 years of age.

H. C. Schroeder, treasurer of the San Antonio Portland Cement Co., San Antonio, Texas, died May 23.

Lee Parsons, secretary of the Oregon Portland Cement Co., Portland, Ore., died May 22 at the age of 66. He had been associated with the company for 35 years.

Edwin S. Crosby, retired president of the Johns-Manville International Corp., New York, N.Y., died May 8. Mr. Crosby was formerly vice president in charge of sales and a director

of the Celite Co. of Los Angeles, Calif. When this firm was acquired by Johns-Manville in 1928, he was named president and director of Johns-Manville International Corp., and held this position until his retirement in 1951.

B. J. Roberts, sales manager for Deister Machine Co., Fort Wayne, Ind., passed away May 24. He was 79 years of age. Well known in the non-metallic mining field, Mr. Roberts joined Deister in 1925 as sales manager, which position he held until the time of his death.

Lawrence Rukeyser, founder and first president of the Colonial Sand and Stone Co., New York, N.Y., died May 26 after a long illness. He was 75 years old. Mr. Rukeyser, who retired from Colonial in the late 1920's, had been secretary-treasurer of the Manhattan Sand Co., predecessor of Colonial, and an officer in other building materials concerns.



PAYHAULER FLEET whips 17% grade with bonus loads

The Caldwell Engineers' five-unit 65 Payhauler® fleet highballs 2,500 cu yd of shot rock 1,000 feet daily up a haul road with 17% average grade. That's how this subcontractor keeps on schedule! His contract calls for excavating and crushing 165,000 tons of rock on the \$13,000,000 hydro and flood control Oliver Dam under construction at Columbus, Ga.

Making the 17% grade with bonus loads is routine for the Payhauler fleet on this newest of all dams being built by the Georgia Power Co. at Columbus.

"These are crooked haul roads," reports excavation foreman Dudley Rabb, "but our Payhauler fleet is whipping them to keep us on schedule. The rigs haul through axle-deep water 50% of the time...make pull-outs up roads that rise 170 feet in 1,000 feet...yet speed bonus loads to crusher and stockpile."

Prove the get-away surge, and up to 25% faster haul speed of an International Payhauler—the result of bonus turbo-charged diesel power; road-matched and load-matched gear choice; and the power-cushioning leverage of planetary drive axles.

See how a Payhauler shortens the cycle with pick-up truck spotting ease. Discover how exclusive high reverse, zip-around power steering, and grade-beating power boost your profits. Try split-second dumping with the double-acting hydraulic hoist. Measure the advantage of Payhauler operating ease, and downgrade safety of positive Torqmatic braking! See your International Equipment Distributor for a demonstration!



*International
Construction
Equipment*

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.



ALLIS-CHALMERS CRAWLER TRACTORS . . . first choice on more and

ALLIS-CHALMERS

HD-21



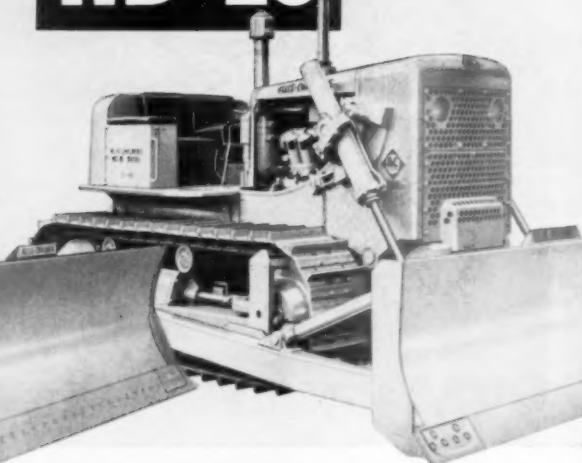
225-hp turbocharged engine
Hydraulic torque converter drive
56,260 lb (approx. as shown)

The new HD-21 brings you live power for today's big-tractor jobs—and torque converter drive puts it to work automatically. The HD-21 offers more work capacity—dollar for dollar—than any other big crawler tractor you can buy.

HD-21A illustrated—Two other models available

ALLIS-CHALMERS

HD-16



CHOICE OF TWO OUTSTANDING DRIVES

Hydraulic torque converter
150 net engine hp
39,090 lb (approx. as shown)

All-gear drive
141 belt hp
125 drawbar hp

Get up on the HD-16 yourself—and see how it handles jobs ordinarily assigned only to bigger, more expensive crawler tractors. You'll sell yourself—just as more keen-eyed construction men do every day.

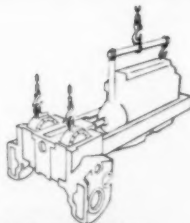
HD-16DC illustrated—Five other models available

THE ONLY COMPLETE LINE OF CRAWLER TRACTORS

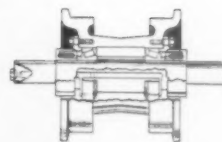
**Pioneered
and proved by
Allis-Chalmers
Engineering
in Action**



Torque Converter Drive gets more work done—automatically provides the right pull or push for every load, at maximum speed for existing conditions. (Available in HD-21 and HD-16 only.)



Unit Construction saves valuable time . . . lets you remove any major assembly without disturbing adjacent assemblies.



1,000-Hour Lubrication intervals for truck wheels, idlers, support rollers . . . changes daily greasing time into production time.

Look ahead...move ahead...and stay ahead

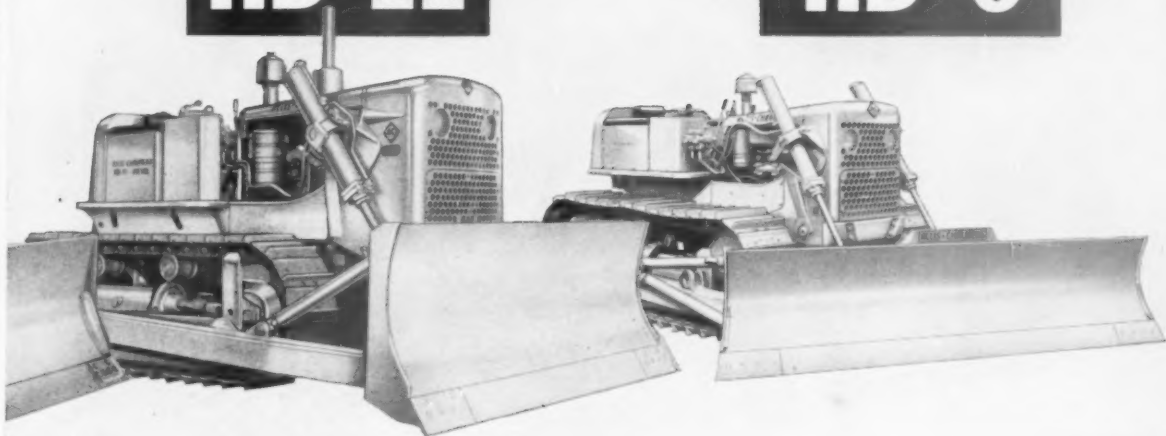
more tough jobs

ALLIS-CHALMERS

HD-11

ALLIS-CHALMERS

HD-6



94 belt hp

25,960 lb (approx. as shown)

The HD-11 is setting new standards in its size range . . . offers you dozens of work-boosting advantages, including the industry's easiest shift pattern. A single shift takes it from any forward speed to any reverse—gets short-cycle jobs done faster, easier.

HD-11B illustrated—Two other models available

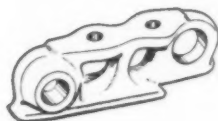
63 belt hp

16,470 lb (approx. as shown)

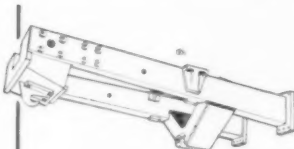
Here's up to 15,500 lb drawbar pull. The HD-6 is the only tractor near its size with big-tractor design advantages—for example, All-Steel Box-A main frame and engine-mounted dozer with direct-lift cylinders for improved weight distribution, accurate dozing and long life.

HD-6E illustrated—Three other models available

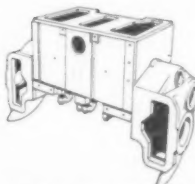
THAT GIVES YOU ALL THESE ADVANTAGES IN EVERY SIZE



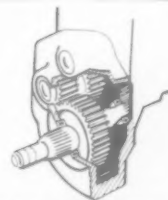
True-Dimension Track heat-treated and machined in the industry's most modern facilities, is setting new track-life records on every type of work.



All-Steel Box-A Main Frame soaks up shock and strain . . . provides improved weight distribution and equipment mounting.



One-Piece Steering Clutch and Final Drive Housing with extreme rigidity and strength . . . line-bored to provide precise alignment of gears and shafts.



Straddle Mounting of All Final Drive Gears with tapered roller bearings on both sides of short, large-diameter shafts . . . provides extra gear life.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

with ALLIS-CHALMERS



Enter 1127 on Reader Card

ROCK PRODUCTS, August, 1958

47



"EVERYTHING WORKING AS PLANNED"

Says Harry Stirland, Engineer, Construction Aggregates Ltd., Westminster, B.C.

CONSTRUCTION AGGREGATES LTD. plant at Britannia Beach, near Vancouver, British Columbia, is a long way from Eagle Iron Works, Des Moines, Iowa. However, an Eagle Fine Aggregate Washing-Classifying-Dehydrating Section for their sand and gravel plant was shipped to them some months ago, was set up by them and is working like a charm. An Eagle field engineer visited the plant recently to check on its performance and was told "Everything is working as planned."

Eagle Engineers appraise a producer's problem, intelligently recommend the needed equipment. Eagle Iron workers make sure that the equipment will fit together and work satisfactorily when it gets to the job.

Construction Aggregates Ltd. is producing concrete sand to specifications with their Eagle equipment



which is designed so that the plant can be readily expanded later to add more washers for production of other gradations of sand.



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EAGLE IRON WORKS

ENGINEERS AND MANUFACTURERS

137 HOLCOMB AVE., DES MOINES, IOWA

Factory Trained Distributors EVERYWHERE!

INDUSTRY NEWS

Gypsum mine expands

H. M. HOLLOWAY, INC., Wasco, Calif., is expanding its gypsum mining operations by 35 percent, it has been announced by Harvey S. Holloway, president. New high-speed equipment has been added to the company's Lost Hills mines. "Additional operating facilities will expand our mining and milling capacities to 3,500 tons of processed agricultural gypsum," said Mr. Holloway.

Volcanic cinder stockpile



EXTINCT VOLCANIC CONES scattered along the Mexican border west of El Paso, Texas, furnish a volcanic cinder that is used for lightweight concrete, aggregate and oil well cement. This cone being worked by the Volcanic Cinder Co., Los Cruces, N. M., furnishes an average of 320 cu. yd. per day. Material loaded out by an International TD-18 tractor with scraper is sent to the crushing and screening plant.

New office building

SOUTHWESTERN PORTLAND CEMENT Co., Los Angeles, Calif., has begun construction of a new office building at its El Paso, Texas, plant. The structure will be in the shape of a wide U, with wings jutting out from the center portion. The lower floor will be parking area and the main floor, resting on reinforced concrete columns, will be used for offices. Approximately 8,000 sq. ft. of parking space and office space of the same area will be provided.



Aggregates firm has film on rehabilitation

AMERICAN AGGREGATES CORP., Greenville, Ohio, has prepared "The Rumor," a movie now available for showing. The picture above was taken during production of the film which is a story of the rehabilitation of land by the sand and gravel industry after these basic materials have been mined. It tells how the industry "borrows" land in a community to extract sand and gravel deposits for construction purposes and then returns the land to the community in improved form—as parks, recreation areas, commercial or residential areas.

Facts as opposed to "rumor" show that through long-range planning by progressive industry and forward looking officials, the industry can bring good to the community. The film tells a story that is long overdue in the telling. William Rhodes, treasurer of American Aggregates, should be contacted for information concerning the film.

Modernize precipitators at Oro Grande plant

RIVERSIDE CEMENT CO., Los Angeles, Calif., a division of American Cement Corp., is modernizing dust collection at its five-kiln Oro Grande plant, according to John Kinard, president of Riverside. Tests of the new "Koronamax" electrode on its No. 2 kiln have led to a contract to equip its entire battery of five electrostatic precipitators with the device.

The Koronamax is a braided wire electrode with clusters of barbs at regularly spaced intervals to prevent irregularity in the electromagnetic attraction (ROCK PRODUCTS, April, 1958, p. 101). The new electrodes, plus other Koppers accessories to modernize the Oro Grande precipitators, will be delivered and installed during summer and fall, with completion of the job expected October 1.

Riverside's Crestmore plant officially opened its new \$661,500 office and laboratory June 7. Constructed of reinforced concrete, the building features

the latest in structural and ornamental concrete, as well as wide use of manufactured concrete products. The building houses Riverside's engineering and research, accounting, laboratory, exploration and mining, personnel, supervisory, public relations departments.

Phosphate plant nearing completion

CENTRAL FARMERS FERTILIZER CO., Chicago, Ill., is nearing completion of its phosphate fertilizer plant and mine at Georgetown Canyon, Idaho, 17 miles north of Montpelier. By the end of the year, the facilities, estimated to cost between \$14 and \$15 million and employing 300 persons, will be in production. Between 70,000 and 120,000 tons of calcium metaphosphate will be produced annually, and from 160,000 to 180,000 tons of acidulation grade phosphate rock.

(Continued on following page)

INDUSTRY NEWS

(Continued from preceding page)



Pipeline is portable

HANGING DOWN the 700-ft. face of the wall of Glen Canyon is a portable pipeline being used in construction of a diversion tunnel for Glen Canyon Dam. The 6-in. diam. Wade Quick-lock aluminum pipeline was suspended from canyon edge to water level by Mountain States Construction Co., who has the contract for the tunnel. Merritt-Chapman & Scott are prime contractors on the Glen Canyon project in northern Arizona for the U. S. Reclamation Service.

Correction

IT'S ALL WHITE, but it is not "an abandoned limestone cave" in the picture on p. 60 of the June, 1958, issue. Pioneer Silica Products Co., Pacific, Mo., stores its sparkling white St. Peter silica in worked out underground sections of the deposit after crushing and washing. And to further straighten out a mixed-up item, we must report that there are no "inferior grades" of silica requiring separation at this plant.

Lightweight News—new ECSA paper

THE EXPANDED CLAY AND SHALE ASSOCIATION, Allentown, Pa., has begun publication of its official newspaper, "Lightweight News." The association expressed hope that members would put it to promotional use in boosting advantages of expanded clay and shale lightweight aggregates. The first copy, published in May, was mailed to editors and leading figures in the industry to publicize work and objectives of the organization.

Marquette shows caution toward depletion refunds

MARQUETTE CEMENT MANUFACTURING Co., Chicago, Ill., is not entering tax refunds for depletion allowances as assets until they are collected, said W. A. Wecker, president, at the company's 56th annual meeting. Mr. Wecker's statement on the subject was as follows:

"The Internal Revenue Service has now begun to investigate our claims for tax refunds based on expanded depletion allowances such as were approved last year by the courts in a case brought by another cement producing company. These claims, plus the estimated tax saving for 1957, aggregate approximately \$11,800,000, exclusive of interest.

"Until collected, no part of these claims will be reflected in our income accounts or entered as assets on our balance sheets. Also, so long as the claims remain in dispute, or until the issuance of conforming Treasury regulations, we will continue to state our net income on the basis of the lesser depletion allowances of previous years.

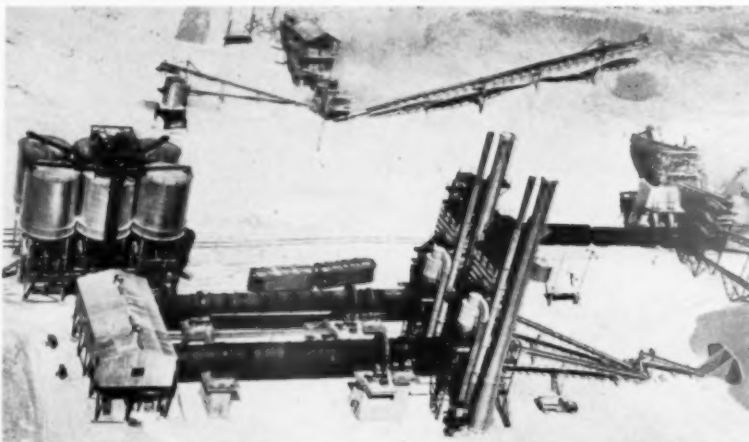
"It is tempting to show substantial earning increases through use of the

new higher depletion allowances, but this could become embarrassing if later revisions had to be made. Even now the U. S. Treasury is seeking through legislation to limit depletion allowances on cement-making raw materials to the same income basis as for coal and most of the metals. If passed, this legislation would reduce future allowances to about the level the Treasury had previously determined was applicable to cement under present law."

ARBA sponsors highway conference

THE SIXTH ANNUAL National Highway Conference for county engineers and officials, sponsored by the American Road Builders Association, will be held at the Concord Hotel, Kiamesha Lake, N. Y., September 29-October 1, 1958. One thousand delegates are expected to attend. Some topics to be covered in the three-day meeting are Priorities for Highway Improvement; County Problems Created by the Interstate Highway Program; Small Bridge Standardization; Equipment for Excavation, Grading, Stabilization, Compaction, Surfaces, Highway Operation.

Flintkote opens new lime plant in Nevada

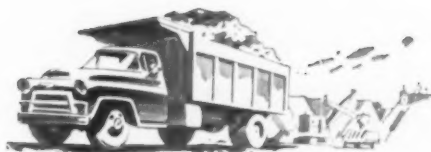


UNITED STATES LIME PRODUCTS CORP., Los Angeles, Calif., a subsidiary of The Flintkote Co., opened a \$2-million lime processing plant May 28 at Arrolime, Nev. The unit expands to 55 plants the string of Flintkote's international operations. According to I. J. Harvey, Jr., Flintkote's chairman of the board and chief executive officer, the increased lime processing facilities were needed "to meet the steadily rising demands for various lime products by the major metallurgical, paper, chemical and construction users throughout the western states."

Started in July, 1957, the modern

lime calcining plant will have a production capacity in excess of 400 tpd. Shipping by rail or truck is possible, as it is located on the main line of Union Pacific Railroad and adjacent to U. S. Highway 91. The plant was designed, engineered and equipped by Kennedy-Van Saun Manufacturing and Engineering Corp. Two 10 x 150-ft. rotary kilns form the heart of the operation. They are completely instrumented with the centralized instrument panel on the kiln firing deck. The plant was erected in only ten months by J. H. Pomeroy & Co., San Francisco.

(Continued on page 53)



Want to get there Quicker, Safer, at Lower Cost?

Eaton 2-Speed Axles Will Do It!

Eaton 2-Speed Axle trucks make quicker, full-load trips—with no sacrifice of power when it's needed to pull out of the tough spots. But they do more than save time; they save money, too. With double the conventional number of gear ratios right at their finger tips, drivers use the right gear ratio for every operating condition. This lets engines operate in their most efficient and economical speed range; stress and wear are reduced right down the line from the engine to the axle itself. Operating and maintenance costs are cut to the bone. And through improved maneuverability and reduced driver fatigue, Eaton 2-Speed Axle trucks make not only quicker trips but safer ones. They haul more at lower cost per mile, last longer, and are worth more when traded in.



More than Two Million
Eaton Axles in Trucks Today.
For complete information,
see your truck dealer.

EATON

AXLE DIVISION
MANUFACTURING COMPANY
CLEVELAND, OHIO



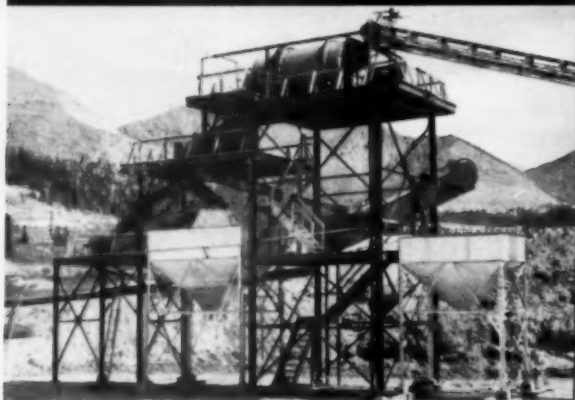
PRODUCTS: Engine Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Hydraulic Pumps
Motor Truck Axles • Permanent Mold Gray Iron Castings • Forgings • Heater-Defroster Units • Automotive Air Conditioning
Fastening Devices • Cold Drawn Steel • Stampings • Gears • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

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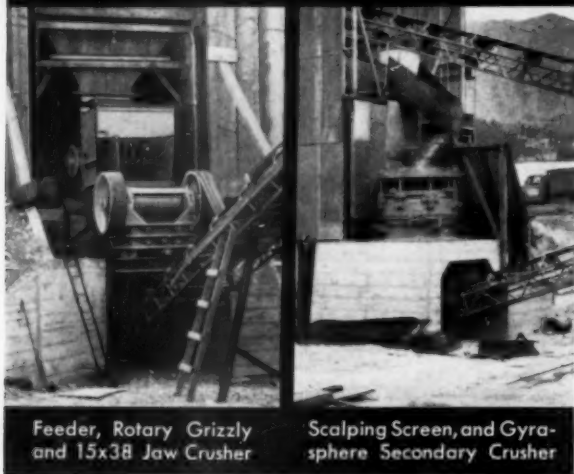
COLORADO Concrete Aggregate Plant



C. Ryan & Son aggregate plant near Climax, Colorado



TelSmith Super-Scrubber, Vibro-King Finishing Screen, and Sand Classifier, and Gravel Rewasher over steel bins



Feeder, Rotary Grizzly and 15x38 Jaw Crusher

Scalping Screen, and Gyra-sphere Secondary Crusher

G-31

TELSMITH
*designed and
equipped*

The C. Ryan & Son aggregate plant, near Climax, Colorado, makes three sizes—minus $1\frac{1}{2}$ " plus $\frac{3}{16}$ ", minus $\frac{3}{16}$ " plus $\frac{1}{4}$ ", and minus $\frac{1}{4}$ " sand. This complete TelSmith plant has a capacity of 100 tons or more per hour and its products are used to make concrete aggregate for large industrial companies. Let TelSmith engineer your plant for big capacity, product flexibility, and low-cost efficient operation. Send for Bulletin 266.

TELSMITH EQUIPMENT IN THIS PLANT

30" x 5'6" Heavy Duty Plate Feeder • No. 450 Rotary Grizzly • 15 x 38 Roller Bearing Jaw Crusher • 3' x 10' Single Deck Vibro-King Scalper • 36-S Gyra-sphere Secondary Crusher • 72" x 10' Super-Scrubber • 4' x 10' Double Deck Vibro-King Finishing Screen • 20" x 13' Twin Screw Rewasher • 24" x 19' Single Screw Sand Classifier • Three (3) Belt Conveyors.

SMITH ENGINEERING WORKS

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MILWAUKEE 1, WISCONSIN

Representatives in Principal Cities in All Parts of the World

• Cable Address: Sengworks, Milwaukee

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INDUSTRY NEWS

(Continued from page 50)

A comment on Rocky's notes

Dear Mr. Rockwood:

You write in the April 1958 ROCK PRODUCTS, p. 17, that in your opinion the ASTM Lime Committee's definition of a pozzolan is much better than the one now in ASTM. ASTM Designation C 219, under Committee C-1 on Cement, defines Pozzolan as "A siliceous or siliceous and aluminous material, which in itself possesses little or no cementitious value but will, in finely divided form and in the presence of moisture, chemically react with calcium hydroxide at ordinary temperatures to form compounds possessing cementitious properties."

The definition that you prefer and quote has the following differences:

1. For "siliceous and aluminous" it reads "aluminum-siliceous." This is not an improvement; it is an infelicity.

2. For "calcium hydroxide" it reads "alkali and alkaline earth hydroxides." In the category of "alkali and alkaline earth hydroxides" the one of predominant importance is calcium hydroxide.

3. For "to form" it reads "to form or assist in forming." This rather cumbersome unexplained statement of alternative phenomena becomes necessary as a result of the generalizing of the reactants noted in item 2 above. By dragging in lithium, sodium, potassium, rubidium, cesium, beryllium, magnesium, strontium, barium, and radium—in addition to calcium—they can no longer simply say "to form." Further, I doubt that data to support the contention that *all* reactions of "siliceous or aluminum-siliceous materials" otherwise meeting the definition, with lithium, rubidium, cesium, beryllium, strontium, barium, and radium hydroxides do in fact "assist in forming" cementitious compounds. I further doubt that it would be worth the effort to find out whether they do or do not.

As you know, I am interested in good definitions. I believe, however, that the definition that defines best is the one that most precisely limits that which it defines. Definitions including broad group terms are sometimes necessary, but not, I believe, in this case.

Sincerely,

Bryant Mather

Dear Mr. Mather:

I have your very interesting letter of April 15, concerning my remarks in ROCK PRODUCTS on C-7 Committee's definition of a pozzolan to be used with lime. I agree with you that the term "siliceous and aluminous" is

(Continued on following page)

4 BIG REASONS WHY



Hanco ELECTRIC SCREEN HEATERS
serve best in American Industry

- 1 • ELIMINATE BLINDING
- 2 • INCREASE TONNAGE
- 3 • BUILD GREATER PROFITS
- 4 • SPEED PRODUCTION

We welcome your inquiries. Be sure to include materials for screening and equipment in use. Hannon engineers will make recommendations which will increase your production and reduce your screening costs. Data sheets available without obligation.

PIONEERS IN ELECTRIC SCREEN HEATING

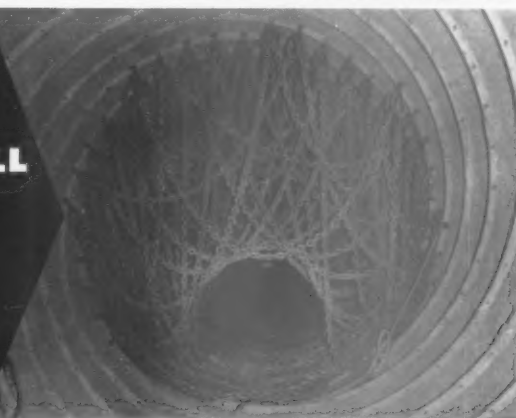
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Announcing
new
**CAMPBELL
KILN
CHAIN**
in two
grades



Carbon Steel . . . and New Thermal-Abrasive Resistant No. 7

Now, Campbell Kiln Chain is available in two types of material and in Proof Coil, BBB or Passing Link styles. Campbell Kiln Chain can be supplied to fit any chain system currently in use, and Campbell components for attaching chain within the kiln can be supplied to the same physical specifications as the chain desired. For details contact your Campbell representative, or write the Engineering Division in York, Pa.

Campbell also manufactures a complete line of chain for all phases of the mining industry.

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CHAIN**

CAMPBELL CHAIN Company

York, Pa.—West Burlington, Iowa • East Cambridge, Mass., Chicago, Ill.
Portland, Ore., Seattle, Wash., Los Angeles, Sacramento, San Francisco, Calif.
Makers of Jiffy Lug-Reinforced Tire Chains and Blue Temper-pre-cut, packaged chain.

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NEW "ROLLER CLEANER" provides greatly simplified method of cleaning dust from filter bags. Resilient rubber rolls automatically adjust to form a positive dust seal as each row of bags is cleaned by atmospheric air.

FROM DUST SOURCES

CLEANING AIR FROM ATMOSPHERE

CLEAN AIR TO FAN

Patent No. 2583039
Patent No. 2695681
Other Patents Pending

Now with the
NEW SLY
"ROLL-CLEAN"
DYNACLONE

**As much as
3 TIMES LONGER
BAG LIFE**

NEW SLY "RESIST-O-WEAR" FILTER BAGS (patent pending) provide complete dust filtration with as much as three times longer life than conventional bags. This has been proved on the toughest field installations.

The new bag has three equal-size sections. Each pocket has two spacers, making a total of six per bag. Weight is distributed on

three seams rather than one, minimizing strain. A special protective flap on the back end prevents abrasion from incoming dust.

Now standard in the new "Roll-Clean" Dynaclone, Sly "Resist-O-Wear" bags combine with all the other superior Dynaclone features to assure greatest dust collecting efficiency with unequalled maintenance-free service.

ALL THESE FEATURES IN ONE DUST FILTER

- New "Resist-O-Wear" bags last as much as three times longer.
- Free-rolling cleaner. Complete dust seal—automatic seal adjustment.
- Constant suction at dust sources—complete dust collection.
- Greater filtering capacity; smaller space requirements.
- Automatically self-cleaning for continuous operation.
- Simplified construction for ease of inspection and servicing.

SEND FOR New Bulletin 105 and
New 36-page Dust Control Catalog 104.



THE W. W. SLY MANUFACTURING CO.

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INDUSTRY NEWS

(Continued from preceding page)

preferable to "aluminum-siliceous," although the intended meaning is apparently the same.

The reference to the reaction with alkali I believe is an improvement—in fact the improvement—I had in mind when I wrote the Notes article. There is little doubt in my mind, as a result of much reading on the subject, that the reaction of the pozzolan with an alkali—sodium and potassium being the only ones likely to be encountered in any common mineral—whether the alkali is in the pozzolan or in the lime or cement or is added independently—is beneficial up to a certain point. In other words, as the Lime Committee's definition states: "assist in forming cementitious compounds."

There are some portland cement industry chemists who I know agree with me.

Moreover, I do not agree with you, as an editor, that a definition of a useful product should be as narrow as possible, but on the contrary, as broad as possible.

Sincerely,
Nathan C. Rockwood

Blast furnace slag production statistics

An all-time-high value of \$52 million was reached by the 35 million tons of blast furnace slag produced during 1957, according to the Bureau of Mines. Statistics have been compiled from a canvass conducted by National Slag Association in cooperation with the Bureau of Mines. Included are production figures of 43 companies operating 63 plants processing air-cooled slag, 19 plants processing granulated slag and 21 plants producing expanded slag.

Screened air-cooled slag decreased one percent to 25,414,327 short tons, and the value increased four percent to \$40,202,524. Output of unscreened air-cooled slag totaled 2,166,678 short tons valued at \$1,408,412, increases of three and 10 percent, respectively, compared with 1956 figures. The output of granulated slag totaled 4,318,485 short tons, a decrease of seven percent from the 1956 total. Expanded slag production dropped slightly from the 1956 record to 2,941,650 short tons valued at \$8,434,807 in 1957. Iron blast furnace slag was produced in 15 states, but most of the material was processed in the steel centers of Pennsylvania, Ohio and Alabama. Ohio led in terms of value, but Pennsylvania led in tonnage.

(Continued on page 56)



Select your cast
elevator bucket from

LINK-BELT's complete long-life line

Greater efficiency . . . longer bucket life . . . fewer shutdowns—you get all these benefits when you choose the Link-Belt cast bucket that matches your elevator and the materials you handle. They're available in six styles—each in a full range of sizes to meet capacity requirements.

Smooth surfaces, well-rounded corners and proper proportioning assure quick filling . . . fast, clean discharge. In addition, Link-Belt buckets are cast from high-grade malleable iron . . . reinforced at points of greatest stress to resist wear and distortion. For facts on the type and size that's best for your operation, see your Link-Belt office or authorized stock-carrying distributor. Or write for your copy of Book 2465.



CAST ELEVATOR BUCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville (Sydney), N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,728

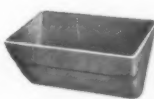
CAST BUCKETS
are also available
in longer-lasting Promal
for longer life under
severe abrasive conditions

STYLE A



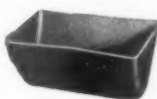
This type is used on elevators handling coal, cement, chemicals and similar materials.

STYLE AA



Designed to handle same materials as Style A buckets. Has reinforced lip for added wear life.

STYLE AA-RB
(Reinforced Back)



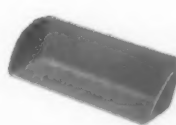
Elevate same types of materials as Style AA buckets. Designed for extra-heavy service conditions.

STYLE B



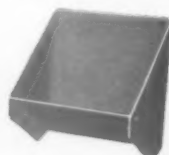
These buckets are used extensively for handling coke, ores, stone and similarly coarse materials.

STYLE C



Designed for handling clay, salt, finely pulverized ores, and other sticky materials.

CONTINUOUS



Used for clean, gentle handling of coal, sand, gravel, crushed stone and other dry materials.



"WHAT'S 'BONDED BUY'?"

When you make a "Bonded Buy" purchase from your Caterpillar Dealer on any used Cat-built machine, he gives you a Guarantee Bond of up to \$10,000.

And you can be sure that the used equipment you buy is in the best possible condition at the lowest reasonable price.

"ANYBODY ELSE OFFER 'BONDED BUY'?"

No—just your Caterpillar Dealer.

"DOES HE OFFER ANY OTHER KIND OF PROTECTION ON USED EQUIPMENT?"

"Certified Buy." This covers any make machine and includes his written guarantee. And "Buy and Try"—which carries a written money-back agreement.

"WHAT DOES ALL THIS MEAN TO ME?"

That you can be sure of a safe buy when you buy used equipment from your Caterpillar Dealer. Call him today.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

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**BEST BUY IN NEW
AND USED EQUIPMENT**

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INDUSTRY NEWS

(Continued from page 54)

Sand screening, settling booklets are available

TWO BOOKLETS on sand preparation that were originally published as a service to ROCK PRODUCTS readers are still available and may be had by writing this magazine. Nathan C. Rockwood's *Screening Fine Materials*, copyrighted in 1946, is an authoritative discussion of determining factors in the operating efficiency of vibrating screens.

Another volume, *Fundamental Principles of Sand Settling* (copyright 1929 and 1943) was written by the late Edmund Shaw as a practical guide to

commercial sand producers. A limited number of these standard references still on hand will be given to individuals requesting them.

Revise cement film

PERMANENTE CEMENT Co., Oakland, Calif., has revised its documentary film, "Cement—Stone of the Ages," and is making it available to interested groups in the west. The 25-min. color movie follows the development, role and products of the cement industry from the stone age to the age of powered missiles.

Shown are some of the great construction projects in the west, and their spectacular use of cement.

(Continued on page 58)

Calendar of Coming Conventions

1958

September 17-19, 1958—

Rocky Mountain Minerals Conference (AIME), Salt Lake City, Utah.

September 22-25, 1958—

American Mining Congress, 1958 Metal Mining and Industrial Minerals Convention and Exposition, San Francisco, Calif.

Sept. 30-Oct. 2, 1958—

National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, The Tropicana Hotel, Las Vegas, Nevada.

October 9-11, 1958—

National Lime Association, Fall Operating Meeting, Hotel Cleveland, Cleveland, Ohio

October 13-18, 1958—

National Industrial Sand Association, Fall Meeting,

The Greenbrier, White Sulphur Springs, W. Va.

October 16-18, 1958—

Empire State Sand, Gravel and Ready Mix Association, Fall Conference, Concord Hotel, Kiamesha Lake, N.Y.

October 21-22, 1958—

National Slag Association, 41st Annual Meeting, The Mayflower Hotel, Washington, D.C.

October 23-25, 1958—

Mid-America Minerals Conference (AIME), St. Louis, Missouri.

1959

January 27-30, 1959—

National Crushed Stone Association, 42nd Annual Convention, Bar Harbour Area Hotel Group, Miami Beach, Fla.

LONGER, MORE PROFITABLE ROLLER LIFE—THE RESULT OF CONTINUOUS IMPROVEMENT OF CATERPILLAR PARTS

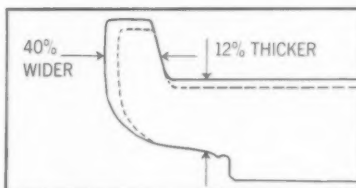
Cat "500" Track Rollers for D8s now have increased rim size for greater strength

A ceaseless search for ways to improve parts performance goes on at Caterpillar. Engineers are constantly striving to make each machine part do its job better, longer and more economically. The payoff for the customer is the steadily improving performance of Cat machines on the job.

New "500" Track Rollers for Cat D8 Tractors, for example, have been redesigned to better resist wear and breakage on the tough jobs. The roller rim has been thickened 12% in its critical area; the flange is 40% wider. The new design prevents roll-over and bending of the outer flange under severe side hill loads.

All Cat roller rims are designed so that treads and flanges may be economically rebuilt by automatic welding—a feature which results in big savings over the life of a tractor.

But that's only part of the story. Matchless Caterpillar quality starts with selection of steel. Extensive testing in Caterpillar metallurgical laboratories eliminates all but the finest quality steel before roller man-



ADDITIONAL MATERIAL on new D8 roller rim is shown by dotted line, above. Thicker, stronger flanges give greater wear resistance and a longer productive life.

ufacturing begins. Further tests (61 in all) are made at every stage of production.

Cat roller rims are made from forgings to insure maximum strength and uniformity. They are bored and given a controlled heat treatment producing thick, file-hard wear surfaces; the remainder is left tough to resist shock damage.

These rims are shrunk onto cast-iron hubs of high compressive

strength and then center welded. This prevents bore distortion and separation. Automatic precision machines finish-bore the roller assemblies. Careful inspection guarantees uniform quality.

Similar Caterpillar quality is built into track roller bearings and shafts, too. A special bronze alloy is used in Cat bearings to support extra-heavy loads. A cast-iron bushing with high compressive strength encloses the bearing.

There is only one way to get maximum production—the production you paid for—from your equipment. Keep your big, yellow machines on the job by using only constantly improved genuine Cat parts. Your Caterpillar Dealer has full information about the new Cat "500" Track Rollers and all the other quality Caterpillar parts. See him today.

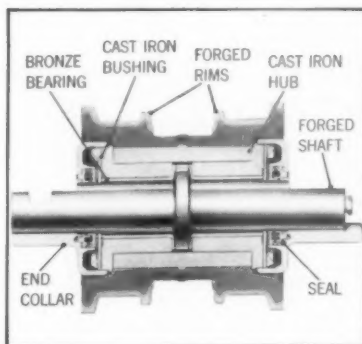
Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

Ask your Caterpillar Dealer about the additional economies provided by 500-hour lubrication periods.

CATERPILLAR

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ROLLER CROSS SECTION of Cat "500" Track Roller shows rugged construction. Roller shafts are forged for controlled grain structure, maximum toughness and to permit superior heat treatment. Wear surfaces are hardened to a depth of at least 3/32", leaving a tough, strong core.



TOUGH JOBS, like the one pictured above, play havoc with any but the best track rollers. Here's what happened on an actual job: New Cat rollers were installed on the right side of a tractor; another brand of rollers on the left side. After 668 work hours, seals and bearings

of two of the other brand rollers failed. They broke up and were lost from the roller shell. The Cat rollers showed normal wear and the 500-hour lubrication proved its value. Owners everywhere are proving that it pays to standardize on Caterpillar—equipment and parts.

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THE RIGHT SCREEN FOR YOUR JOB!



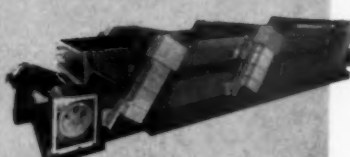
VIBREX



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hi-G

**ONLY H-R
MAKES ALL 4**

Are you faced with a really tough problem in sizing . . . scalping . . . washing . . . rescreening . . . dewatering? The *right* Hewitt-Robins screen is your answer!

Vibrex: Here's the most versatile screen of them all! Simple, field adjustable, stroke, speed, angle to match any requirement . . . circle-throw principle with two massive self-aligning bearings . . . rock-bottom economy coupled with long-life ruggedness!

Eliptex: Exclusive elliptical motion for horizontal operation gives high capacity, fast material progression, and sharp sizing.

Gyrex: This positive-stroke, four-bearing, circle-throw screen has an unsurpassed record for stamina.

hi-G: A modified-resonant unit that has the extra kick for hard-to-screen materials at only a fraction of usual power requirements. Both decks are accessible for cloth changes.

All 4 in standard *suspended* and *base mounted* models!

Whatever your specific screening problems, you will find one of these Hewitt-Robins units *best* fitted for the job. For information or service, contact your local H-R representative, or Hewitt-Robins, Stamford, Connecticut.



HEWITT-ROBINS

CONVEYOR BELTING AND IDLERS . . . POWER TRANSMISSION DRIVES
INDUSTRIAL HOSE . . . VIBRATING CONVEYORS, SCREENS & SHAKEOUTS

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Amsterdam, Holland • Johannesburg, South Africa • London, England • Montreal, Canada • Paris, France

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PEOPLE IN THE NEWS

(Continued from page 56)



King-size crusher

THIS 17½-FT. DIAM. top shell section of a crusher destined for Riverside Cement Corp., Los Angeles, Calif., was photographed prior to shipment at the Allis-Chalmers shops. The gyratory crusher will have a 60-in. feed opening and an 89-in. diam. crushing mantle. It is designed to crush limestone up to 5-ft. diam. to minus 8 in. at a rate of 1,500 to 2,000 tph.

New round of cement contracts signed

CEMENT MANUFACTURERS whose contracts expired this summer with the AFL-CIO Cement, Lime and Gypsum Workers Union negotiated new agreements following the same pattern, according to Toney Gallo, secretary-treasurer of the union. Terms included a pay raise of eight cents an hour, plus increases averaging two cents an hour for workers above bottom scale. This was done to widen the gap between salary scales.

Other terms were time-and-one-fifth for Sunday work and a pension benefit range of \$35.50 to \$81.25 per month. Previously, time-and-one-tenth applied on Sundays and the pension scale was \$30 to \$63 per month.

Twenty-thousand industry employees were affected by contract expirations, including about two thousand at Lone Star Cement Co., last to conduct negotiations with the union.

LITER'S QUARRY INC., Louisville, Ky., has been capitalized at \$75,000 by W. T., Loretta G. and Eugene H. Liter to operate a rock quarry.

CLEAR CREEK SAND AND GRAVEL Co., INC., has been granted a charter to conduct business in Georgetown, Colorado.

(Continued on page 60)

WILLIAMS *heavy duty* HAMMER MILLS



- **Crushes, Grinds, Shreds To Finished Size In One Operation**
- **Reduces Production Costs Up To 50%**
- **Saves Up To 75% On Equipment Cost**



Williams No. 60 GA Mill with heavy duty steel plate frame. Cover has been opened to show heavy duty manganese steel liners, breaker plates, grate bars and hammers.

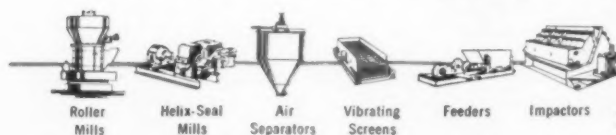
Whether your size reduction job involves crushing, grinding or shredding—whether the material is mineral, chemical, vegetable or animal—Williams has a hammer mill designed to *do it from start to finish in a single operation*. More uniform product, increased output, plus savings in time and labor can *cut production costs as much as half!*

Extra primary and secondary crushers are seldom required with a Williams—no extra drives or

conveyors, no costly foundations or buildings for additional crushers are necessary. Expensive maintenance, replacement parts, excessive downtime and labor are reduced to a minimum.

Learn how a Williams hammer mill can step up your output, and improve your product quality. *Write—explain your operation—and ask for a catalog.*

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
800 ST. LOUIS AVE. St. Louis 6, Mo.



WILLIAMS
CRUSHERS GRINDERS SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

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Buy *Guaranteed Efficiency* in your Dust Collection... Consult **Norblo**

Guaranteed efficiency of fume and dust collection systems engineered and built by Norblo is obtainable because Norblo Equipment includes automatic bag type, improved centrifugal, and hydraulic types. Your operations may require one of these types — or all three! Norblo can tell you — will engineer the necessary combination to handle your dust and fume collection at most economical cost. More than 40 years experience serving many industries. State your problem so we can send literature on equipment applicable to your needs.

Replacement Bags

Dust Arrester bags do wear out eventually, and it's wise to replace them with the type best suited to your operation. Bags of various materials, made to our specifications, are available from the Norblo factory. Write for our Dust Arrester Bag Bulletin containing information on bag selection, hints for making successful bag repairs, and prices on five types of bags.

The Northern Blower Company
6408 Barborton Ave. • Cleveland 2, Ohio

Norblo

ENGINEERED DUST COLLECTION SYSTEMS

FOR ALL INDUSTRIES

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INDUSTRY NEWS

(Continued from page 58)

Ideal charts growth; buys Tacoma property

IDEAL CEMENT CO., Denver, Colo., held its quarterly meeting May 27 at Houston, Texas, when all officers of the company were reelected. Board members toured the company's new Houston plant, now in almost full operation. Other parts of the company's plant program are proceeding on schedule with the Lake Charles, La., terminal commencing operations; the permanent terminal at Sacramento, Calif., began operation June 1 and production is expected at one kiln in the new Ada, Okla., plant before the end of the year. A second kiln will be installed there as rapidly as possible. Construction of the new plant at Albuquerque, N. M., is in full swing with all of the principal machinery at the site.

Ideal has purchased a 29-acre tract on the Tacoma, Wash., Port Industrial Waterway as part of its long-range program. The company is contemplating the erection of a cement storage and distribution terminal there, with the possibility that it also will build a cement manufacturing plant there within a few years. Facilities on the deep-water site would enable Ideal to serve customers in Washington and the Pacific Northwest by ship, barge, rail and truck.

Potash production, exports up in 1957

PRODUCTION OF MARKETABLE POTASSIUM salts in the United States during 1957 totaled a record 3.8 million short tons, according to the Bureau of Mines. Sales and apparent consumption were about the same as 1956. Stocks on hand at the end of 1957 were 27 percent more than at the end of the previous year.

Imports of potash materials to the U. S. during 1957 increased one percent; exports increased 18 percent. World production of potash in 1957 was five percent above 1956.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of May and the first five months of 1958 have been listed by Portland Cement Association:

	Sq. yd. awarded during	
	May	1st 5 mos.
Roads	4,261,372	23,811,766
Streets and alleys	3,691,037	11,950,638
Airports	3,684,630	6,797,672
Totals	11,637,039	42,560,076

END

"OVER 1,000,000 TONS without a whimper from our **SECO *Twin-Bearing*** **SCREENS"**

*Says Jules Koczot, Buffalo Crushed Stone Corporation's Plant Engineer
(A Unit of Mouldable Industries, Inc.)*



**"We've screened 8 sizes of
aggregate for 1½ years without
a minute of downtime"**

"We installed our first 2 SECO TWIN-BEARING SCREENS 1½ years ago and during this time we have run almost around the clock. We have been so pleased with their performance and dependability that we now have a total of 7 in operation in our crushed stone and black top plants."

Yes, Mr. Koczot knows his vibrating screens, and his remarks are typical of the growing list of producers who are switching to Seco Twin-Bearing Screens. Only Seco's "Advanced Engineering" could bring to 2 bearing screens the rugged dependability and smoothness of operation that result in accurately sized materials. No matter how tough the specifications may be . . . you'll meet them with year in and year out consistency . . . with SECO TWIN-BEARING SCREENS on-the-job.

Made Only by **SCREEN EQUIPMENT Co., Inc.**
Buffalo 25, New York

SEND FOR NEW BOOKLET TB-21 TODAY

20-30% HEAVIER SHAFT



Now, an extra margin of safety for peak loads. Correspondingly larger bearings to stand the gaff . . . and help eliminate downtime.

SECO
Twin-Bearing
SCREENS

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HINTS

AND HELPS

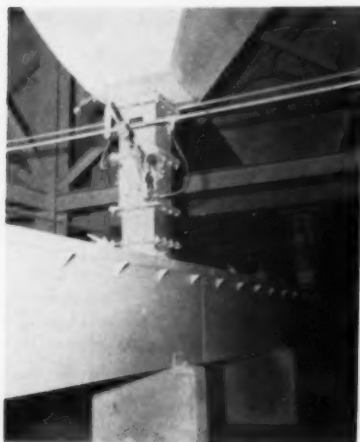
Profit-making ideas developed by operating men



Cobble protector

OPERATORS HAVE DEVELOPED many ingenious devices to remove cobbles and heavy stones from the raw materials going to screens or secondary crushers where the oversize might prove to be harmful to the equipment. This Canadian sand producer simply welded two short angles to the frame of his conveyor, and tack welded a light gauge plate to the angles. The angle of the plate is great enough to roll the few cobbles in the feed material right off the side of the belt and into a pile on the ground.

Dust chutes



AS DUST COLLECTORS become more widely used some of the difficulties in handling dust also become more widely appreciated. One of the problems of dust control is how to insure that the collector discharges all the dust it collects into conveyors or other dis-

posal devices. The most satisfactory method has been the use of counter-weighted gates which operate when the weight of dust on the gates unbalances them and causes the gate to open.

However, many dusts are so light and fluffy that they will not operate even the most delicately balanced gate. This eastern cement plant overcame the problem by installing air operated dust valves. Each gate is opened and closed by the air cylinders, and any accumulation of dust is dropped to conveyors below.

The frequent and continuous action of the gates keeps the dust flowing through the valves, and prevents any accumulation of dust in the hoppers of the dust collectors above the gates.

Screen plates are useful



A MIDWESTERN SAND and gravel producer carefully saves some of the best of his old screen plates and finds plenty of use for them around his plant.

Screen plates make excellent guards for drives. The guard can be fabricated and welded easily, and is rugged enough to withstand a great deal of abuse without damage. The V-belt or chain drive may be observed at all times through the slots or perforations in the plate.

Screen plates make ideal guards for the tops of hoppers and chutes—heavy enough to keep the material in, and open enough to permit the operators to inspect the flow of materials. Here, too, the screen plates may be welded or bolted to supports in the field by a maintenance man.



Finds use for old belts

FEW THINGS AROUND an aggregates plant are as useless as worn out belts. If they have worn out after long service, there is little salvage value and practically no use as splicing material.

However, this thrifty aggregates producer discovered that a section of old belt was just the right thing to keep heavy aggregates from bouncing off the top deck of his elevated vibrating screen. He also uses pieces inside chutes as liners to protect the steel from the damaging impact of sand and gravel. At transfer points, sections of belt prevent the build-up of sand in the transfer hoppers and in the chutes under the belt wipers.

Guard rails



RAILROAD RAILS make excellent guard rails to protect buildings, walkways and open pits which are near heavily travelled truck roadways. The rails have great strength, are easily fabricated and assembled, and are ex-

(Continued on page 64)



CONVEYOR BELTS

"They proved themselves in our first 10 plants, so we picked them for our 11th!"

says director of sand and gravel company

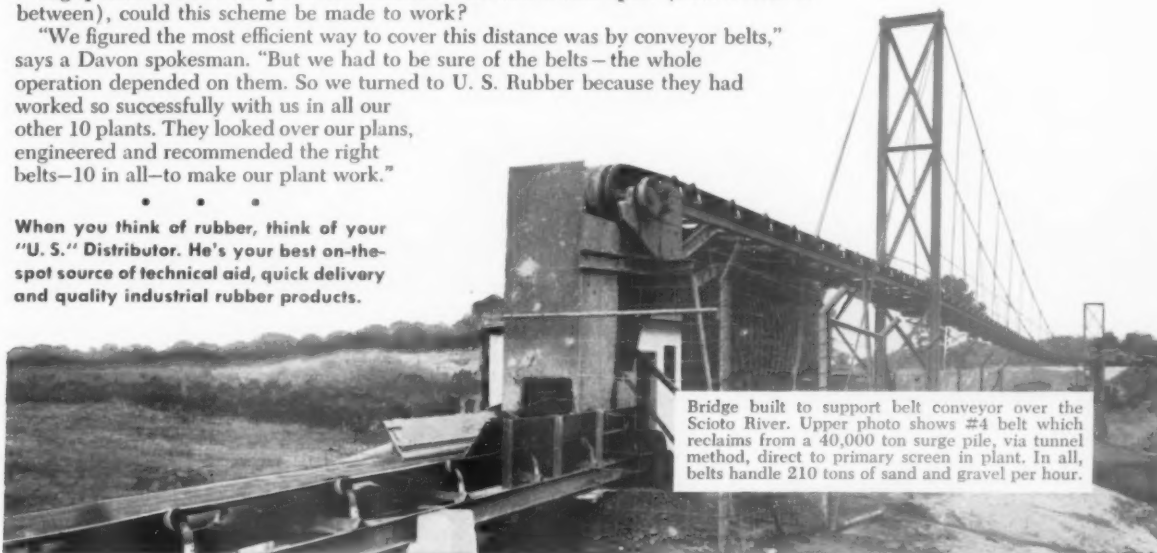


When Davon, Inc., built its 11th plant recently, they decided it would be more economical to bring the material to the plant rather than the plant to the material.

Big question: Since the plant and material were half a mile apart (with a river in between), could this scheme be made to work?

"We figured the most efficient way to cover this distance was by conveyor belts," says a Davon spokesman. "But we had to be sure of the belts—the whole operation depended on them. So we turned to U. S. Rubber because they had worked so successfully with us in all our other 10 plants. They looked over our plans, engineered and recommended the right belts—10 in all—to make our plant work."

• • •
When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.



Bridge built to support belt conveyor over the Scioto River. Upper photo shows #4 belt which reclaims from a 40,000 ton surge pile, via tunnel method, direct to primary screen in plant. In all, belts handle 210 tons of sand and gravel per hour.



Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

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ROCK PRODUCTS, August, 1958

HINTS AND HELPS

(Continued from page 62)

pendable if they become damaged in service.

However, this midwestern rock products producer discovered that his truck drivers have a healthy respect for these guard rails. The rails have seldom been scraped in the several years since they replaced the wooden guard rails which had to be repaired regularly.

Floor treads



PERFORATED SCREEN PLATES are used extensively by an eastern sand and gravel producer for the floor plates in his washing plant. The plates are easily cut to size and fitted to the supports, are strong and durable to support heavy loads, and cost practically nothing beyond the expense of installing them. The perforations do not permit any accumulation of water or of fine materials, but prevent heavy gravel from falling to lower platforms.

Auxiliary lighting



PRACTICALLY EVERY PROCESSING PLANT in the rock products industries has provision for generating auxiliary

electric current in the event of power failure. Some few have equipment to start automatically, and even fewer have equipment to handle the machinery and lighting load for the whole operation.

An up-to-date cement plant was the first one we have seen with provision for auxiliary lighting. Every panel board, stairwell and vital drive can be lighted with a pair of floodlights mounted on a storage battery. Only when the power fails does the battery take over. This relieves the auxiliary generator of the lighting load, and provides plenty of light in critical locations while the generator is being started.

The storage battery is recharged automatically as soon as power is restored to the system, and at any time during the life of the battery when it might lose its charge.

Curtain chains



THE BELTS OF high-capacity belt conveyors often travel at lineal speeds around 500 fpm. even when handling heavy rock from a primary crusher. When this Canadian cement plant discovered that the newly installed stacker belt was flinging 6-in. stone far beyond the storage pile, the plant engineer quickly installed this curtain of chains.

The chains are flexible enough not to be torn by the rock, yet they have enough resistance to deflect the larger pieces down to the top of the pile where they roll harmlessly to the toe of the pile.

Mechanic's platform

ANY MECHANIC who has wished for a "skyhook" as he worked on an engine will appreciate a handy metal platform. Made of galvanized pipe and a safety grip tread, this device gives mechanics a foothold on almost every type of truck. The tread plate is adjustable for various heights, and the loop of pipe will fit snugly over most truck tires. Since it is light and portable, it can be used to make engine adjustments on the road as well as for inspection and shop overhaul.



Safer walkways

ONE OF THE MAJOR SAFETY PROBLEMS in aggregates washing plants is slippery catwalks and walkways. It is especially important to have safe walkways around machinery and along belt conveyors.

This midwestern aggregates producer replaced cleated wooden walkways along this steeply inclined belt conveyor with heavy gauge expanded metal. Now, the workers have secure footing when they service the conveyor in any kind of weather.

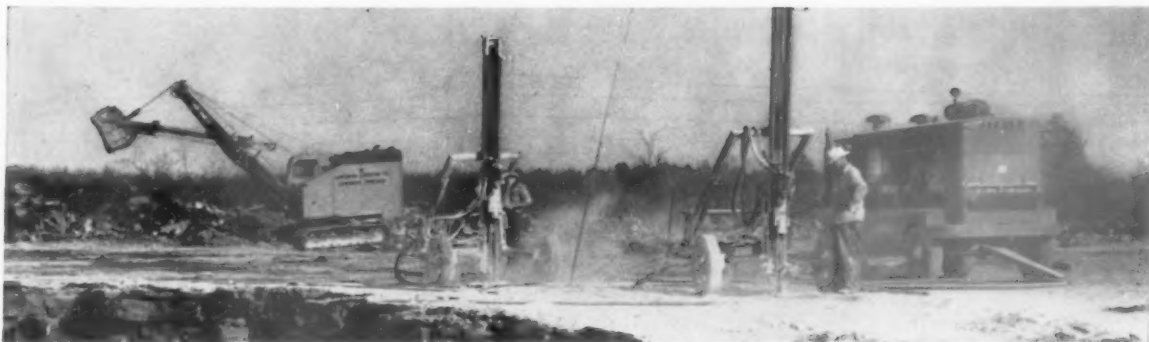
Use old rails



DISCARDED RAILROAD RAILS are some of the most useful items around the plants of rock products producers. Rails are usually readily available at scrap prices, have great structural strength, and are easy to work with.

This midwestern sand and gravel producer uses them all around the plant, but finds the rail stock especially useful to build retaining walls for ramps, truck roads and storage piles. The bases of these rails are securely welded to the flanges of scrap wide-flange beams which have been driven deep into the ground. The result—a retaining wall which is practically indestructible.

END



Logging 500' per shift in limestone with low cost Jaeger air.



Jaeger "600" and dual drill rig, both truck mounted, handle several locations.



Track drills and readily truck mounted Jaeger rotaries make mobile "teams."

Only Jaeger gives you 600 cfm @ 1650 rpm

Using the same GM 6-71 diesel engine as all other "600" rotaries, your Jaeger gives you full rated capacity at 150 rpm slower speed (1650 instead of 1800). In 8 hours full load operation that totals 72,000 fewer revolutions, saving miles of engine piston travel and pounds of fuel.

Because all operation is below the continuous horsepower curve, engine maintenance is at a minimum. As for

the compressor unit itself, many Jaeger rotaries have logged more than 8000 hours without requiring the replacement of a single vane.

125, 250 and 365 cfm models are comparable (1700 rpm full load speed instead of 1800 up). The difference puts money in your pocket. Ask any Jaeger user — or ask us for Catalog JC-7.

THE JAEGER MACHINE COMPANY

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Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario

Gravel and quarry operators rely on modern CAT power for the jobs that are hard and have to get done on time!

"Always use Cat power in the shovel. These engines are long on life and trouble-free."

—GEORGE PATTON, President, Calcite Quarry Corp.

"Very well satisfied with low operating cost and high production of our Cat Engines."

—FRANKLIN TURNER, Turner Lime and Rock Quarry

"Fits our dredge for power and size; when you set this Cat Engine, it will hold its RPMs."

—ERNEST HANSON, Supt., Frazer & Sons Inc.

"Like our Cat Engine's dependability and power, and we get real good service."

—JOHN ROFF, Supt., Coon Valley Gravel Co.

LIKE thousands of others, these owners and superintendents use Caterpillar Engines for the tough jobs, because they must have dependable power that keeps other equipment working full time.

To amplify just one of the above statements, Mr. Patton of Calcite Quarry Corp. of Lebanon, Pa., has good reason to be sold on Cat power for his shovels. The engine in his Lima, a Cat D11000, was installed in 1933 and is still producing big. Calcite purchased this shovel in 1942 and the engine hasn't required an overhaul by a Caterpillar Dealer since then! And since 1942 it has provided power to load more than 3 million tons of high-calcium rock. For one two-

year stretch it operated 16 hours a day around the calendar handling hard rock in choke-dust conditions!

Because Cat power units are reliably rated and built to take the gaff, you often see them widely used on a single job. And for the same practical reasons, you find more and more job-wise contractors buying Cat Engines to repower equipment that won't produce as it used to.

Cat Engines feature a 4-cycle design for smooth, efficient power. Fuel nozzles won't foul under changing load conditions, and Caterpillar's exclusive pre-combustion chambers save money by burning *all* the fuel *all* the time—even low-grade No. 2 furnace oil. The exclusive cast-in cast iron top ring band of the aluminum alloy pistons gives the durability of cast iron and the light reciprocating weight of aluminum for longer life. It all adds up to a power package that won't let you down and costs less to run.

Wherever you buy, Cat power can be supplied. And when you buy, Caterpillar Dealer service is assured. So see your nearby Caterpillar Diesel Engine Specialist soon about your power needs. Review your power line-up now and save down time later.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

A Cat D4600 Diesel Engine powers this Chicago pneumatic air compressor, used for drilling blast holes in lime and rock quarry at Shelby, Mo. The owner of the Turner Lime and Rock Quarry

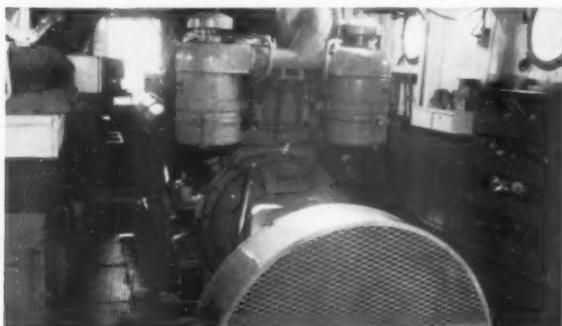
says, "I have increased production and profits since standardizing on Caterpillar products." Quarry is 100' deep and 2 acres big. Cat Engines keep all your equipment working full time.





The Calcite Quarry Corp., Lebanon, Pa., has used the D11000 powering this Lima shovel hard since 1942 — "So," says President George E. Patton, "you can see this Cat Engine has proven its

worth, giving us many years of trouble-free service at low operating cost." Rock taken from quarry near Lebanon is used as fluxing and in cement. Heavy-duty Cat Engines have negligible down time.



This modern heavy-duty Cat D397 Diesel drives a 12" Georgia Iron Works pump for dredging operations on a flood control project in North Palm Beach. One reason Superintendent E. R. Hanson bought Cat power was the "reputation of Caterpillar products."



Supt. John Roff, of the Coon Valley Gravel Co., bought Cat Engines for this job near Des Moines because "It's the best engine made!" Besides a D375, a D318 and a D8800, on the job, a Cat D397 Diesel drives an Amsco pump for this sand dredger.

ENGINE POWER BY CATERPILLAR



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has excellent service facilities to back your engine investment. 844 parts and service outlets throughout 125 countries of the world are strategically located to keep your Cat products earning for you. Here a diesel service specialist checks a fuel injection valve nozzle for proper performance.

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Rock Products

August, 1958

HERCULES



Donald MacBride is president of American Cement Corporation

PEERLESS



Walter Russell is now vice-chairman of American's board

RIVERSIDE



Garner Beckett is chairman of American's board of directors

American's unique merger will it change the course of the cement industry?

By JOSEPH N. BELL

ON JULY 1, THREE PORTLAND CEMENT companies completed the first half-year of one of the most unique, enlightened—and thus far successful—combinations of independent companies ever attempted, not only in the rock products industries but in any industry. It's quite possible that the American Cement Corporation—with its constituent Hercules, Riverside and Peerless companies—is establishing a pattern that other rock producers might one day find profitable to follow. American Cement is, in effect, having its industrial cake and eating it, too. It is attempting to take full advan-

tage of the strengths of both small and large companies, while casting off the weaknesses of both types of operations. So far, according to company officials, things are working out very well, indeed.

There are many highly unusual factors about the merger which created the American Cement Corporation. First of all, the three companies involved were all strong, profit-making, outstanding growth operations; secondly, although the companies are no longer separate corporations they have retained their identities in the American

Riverside's Oro Grande plant in California is the largest of the three companies



Peerless's Port Huron plant in



Three strong, profit-making firms merge in one of the most unusual formations in corporation history

structure, as well as their name, autonomy, individuality, and management strength and flexibility at the local level; and, third, the primary profit-making responsibility is still at the company level—this is, with each of the constituent companies.

As a result of the merger, American Cement is probably the fifth or sixth largest cement manufacturer in the United States with an annual capacity of 18.5 million barrels. It serves a marketing area which last year consumed over 150 million barrels of cement. The combined assets of the three companies are nearly \$75 million, and their sales have increased more than 180 percent in the past decade, as contrasted with 70 percent for the industry as a whole.

But the really exciting thing about American is that it doesn't intend to rest on these growth laurels. It plans to grow more, and the men who head up the company believe they can do it collectively better than they could hope to accomplish it individually.

Don MacBride, American's president, puts it this way: "It was not the purpose of this merger merely to create bigness. The formation of American was a pooling of the interests of three successful companies for the mutual benefit of all. It was formed in recognition of the abilities of a large company to better achieve ends desirable to shareholders, customers and employees. All of our participating companies have grown faster than the industry as a whole. And we have put together these high growth companies with the definite intention of growing further with the steadily increasing demand for cement which we see in the future."

By its regional nature, the cement industry invites multi-plant operations, and the trend has been in this direction in recent years—although

slowly. Small companies have resisted acquisition for a number of potent reasons. Management didn't want its prestige and identification swallowed up in a larger entity; small companies feared that strength and flexibility and service at a local level would suffer in a merger, that the "favored son" treatment of a local industry would disappear, and that the local management would lose control of policy making. As a result, the industry has continued to operate with a large number of small companies having limited financial resources.

The presidents of three of these companies—Don MacBride of Hercules, Walter Russell of Peerless and Garner Beckett of Riverside—were conscious of these shortcomings. But they had two other philosophies in common which weren't shared throughout the industry: all believed that the growth potential for portland cement still has a long way to go; and all three were acutely aware of the advantages of bigness in financing a program of expansion to take full advantage of this growth potential. These men talked about merger with other cement company executives, but always with the idea that one company must necessarily swallow another—which none would accept.

Then they hit on the possibility of a new merger concept in which the companies would retain their own individualities, and centralization would be held to a minimum. It sounded exciting. MacBride flew to the West Coast early in August of last year and discussed the idea with his long-time friend and former college roommate, Garner Beckett. With them were Jim Giles and John Kinard. So sound did the proposition appear that on the second day of their conversations a representative from the investment house of Blyth & Co., Inc., was invited to sit in and help them structure the

Detroit is that division's biggest



Hercules only plant at Stockertown, Pa. produces about 3.5 million bbls. of cement yearly



"The greatest risk we face is the pitfall of

American's unique merger

continued . . .

new company. In a few days, MacBride and Giles were in Detroit discussing the merger with Walter Russell and Bob Morrison of Peerless—and within three months of these first conversations, the entire proposition was ready for the stockholders of all three companies to vote on. Most of the details were ironed out in a prolonged series of shirtsleeve sessions by Giles, Kinard, and Morrison, now President of Hercules, President of Riverside and Vice President and Secretary of American Cement Corp., respectively.

The speedy rapport between the three companies was occasioned by a recognition of problems common to all small companies: the difficulty of obtaining financing to diversify and expand when business acumen strongly dictated such action. This was frustrating in view of market studies which showed that cement consumption was likely to jump to 500 million barrels by the late 1960's. In order to maintain their share of this market, the three companies which make up American would have to increase capacity some 8 million barrels—requiring an outlay of some \$80 million in new capital. The officials of all three companies felt this program could best be financed from the decidedly strong position of merging three already-strong companies. So American Cement Corporation came into being on January 1, 1958.

What were these three companies like at the time of the merger? Riverside was the largest, and its market offered the greatest potential. Its two plants were producing about 8.5 million barrels of cement yearly in the fastest growing major market in the nation. The company had never lost money, yet, because of a complex financial structure, it paid the first dividend on its common stock in late 1957. Control of the company was in the hands of the Henshaw family of San Francisco, descendants of the founder of the Riverside Company. One Riverside plant had been modernized, and the company was considering the erection of

a new plant in Arizona at the time of the merger.

The annual production of Peerless was 6.5 million barrels. Its Brennan Avenue plant in Detroit—one of Peerless' three plants—was one of the newest and most modern in the industry. Its market was concentrated in Michigan, northeastern Indiana and northwestern Ohio—also growing areas. Its president, Walter Russell, had been appointed by a Detroit court in 1933 to act as receiver for Peerless to liquidate it. Mr. Russell asked for permission to try to save the company—and he saved it very well, indeed, directing its operations profitably and successfully over the past 25 years.

Hercules, the smallest of the three, has only one plant, but it's a fine, modern, efficient plant at Stockertown, Penna., which produces about 3.5 million barrels of cement yearly. Hercules believes it has one of the better quarries in the United States. Its market area includes Pennsylvania, New York, New Jersey, Maryland and the New England states. At the time of the merger, it was rather heavily in debt from the burden of financing its just-completed six-year-long modernizing program.

In sales, Hercules has grown to 215 percent of its 1948 performance, Peerless, 360 percent and Riverside, 215 percent. In earnings, Hercules stood at 283 percent of its 1948 performance, Peerless 266 percent and Riverside, 270 percent. All of these figures are well ahead of the average of the industry for the same period. Why, specifically, did three such strong companies decide to merge? There were nine potent reasons:

1. **Increased marketability of the stock**, due to the size and strong position of the combined companies. Although American isn't listed on any stock exchange, twenty-eight large brokerage houses are handling American stock over-the-counter, providing an activity unusual for the stock of a new company. It will probably be listed on one of the major stock exchanges at an appropriate time.

2. **Stability of earnings** because of the diversified markets served by the three companies.

3. **Pooling of financial resources** and earning potentials permitting much greater financial flexi-

growing centralization"

bility. "The single most important advantage," says Don MacBride, "is the strengthening of our financial resources." This will make funds immediately available for expansion and modernizing projects.

4. Opportunity for better management. In the next breath, Mr. MacBride pointed out: "To take full advantage of stronger finances, we must have a strong management team, composed of competent young men possessed of integrity, imagination and drive." All of the companies feel that the American merger will make it possible to attract, hold and utilize good management people. American will provide a real testing ground of what Jim Giles calls "modern management thinking." "One of our foremost practicing philosophies," he explained, "will be to give our management people at all levels a real chance to exercise their own initiative. American will provide exceptional opportunities for able men who are willing to work as a member of our team."

5. Geographic diversification, permitting American's six plants to serve three large and economically diversified market areas. Thus regional variations in demand for cement will be averaged out, as will the effects of other local problems.

6. To make a larger contribution towards industry progress.

7. Greater marketing strength, improving the competitive position of the constituent companies.

8. Greater purchasing power and its corollary: better service from suppliers.

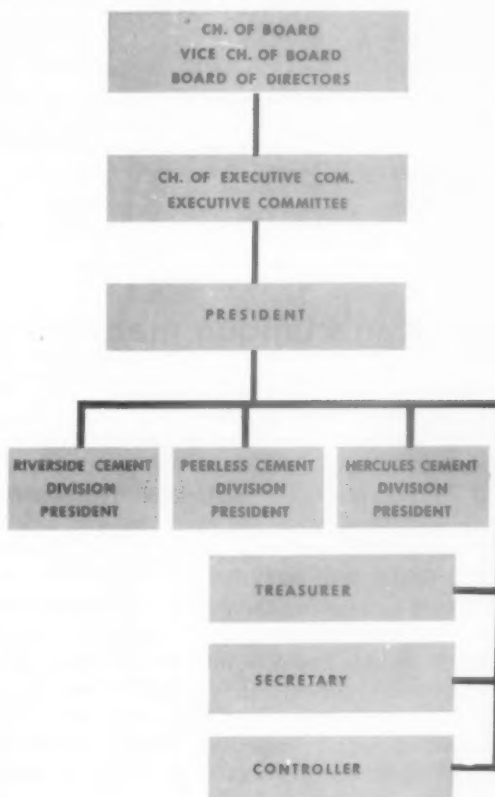
9. Pooling of technical know-how to make possible operating economies and efficiencies. Already, this is proving out. Committees selected from salaried employees of each company are functioning in several operating areas. Accountants, sales managers and plant men, particularly, not only got better acquainted this way but are exchanging many helpful ideas as well.

"But," points out Garner Beckett, "this doesn't mean that we are physically going to pool sales groups, production groups, engineering groups, etc. We believe that through the free exchange of ideas between companies and the cooperative giving of help when asked, the groups will reinforce one another. We are making the whole stronger



These three men (left to right): Jim Giles of Hercules, Bob Morrison of Peerless and John Kinard of Riverside ironed out most of the details

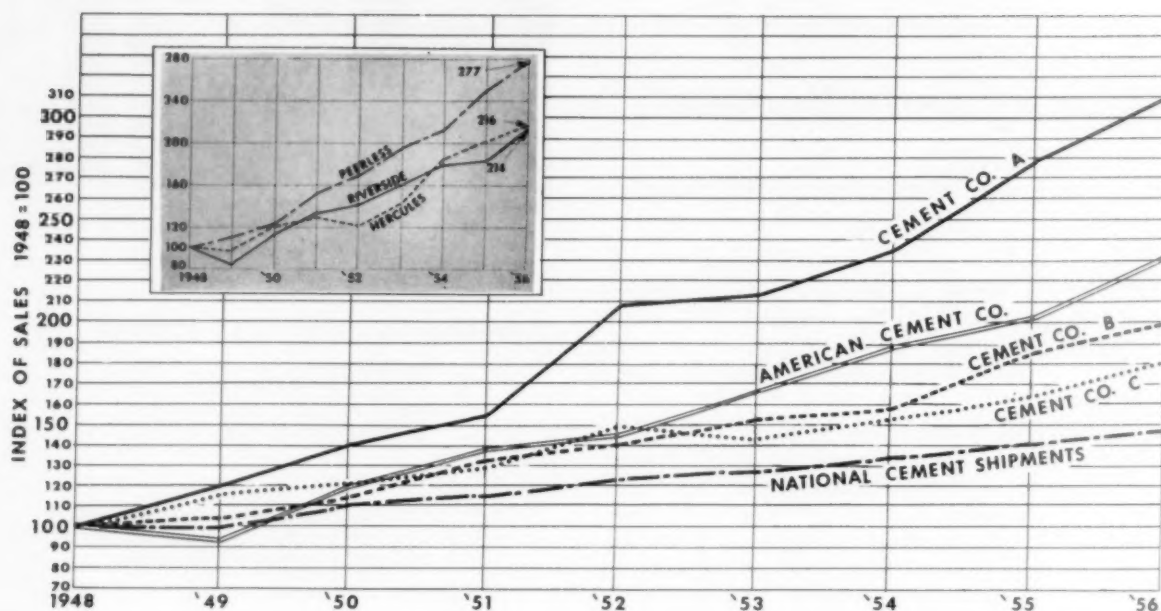
American's organization chart



than the sum of its parts in an atmosphere where cooperation is voluntary, not forced."

In spite of these persuasive reasons, the historic objections to merger still had to be overcome. This, the founders of American think they have accomplished completely—if perhaps, at this stage, a trifle idealistically. The new merger, they say, has caused no change in management of the constituent companies. While company managements report to American instead of a Board of Directors they retain all former prestige or identification with their individual companies. There has been no loss in management strength at the local

American's sales increase above national cement shipments



American's unique merger

continued . . .

level, because the same managements continue to operate as before; thus, there has been no loss in local public acceptance. Individual remuneration plans have been continued, and the new association has given greater opportunity and flexibility for the people who make it up.

Beckett summed up the feeling of all three partners quite well when he said: "During the past 15 years, Riverside has doubled its production of cement and strengthened its position in the market and in the community. This is an outgrowth of the belief which we all share that we must progress or we will inevitably slip backward. We have merged with two other cement companies holding strongly to this same belief with the resulting decision that still further progress can be made through pooling of the people and physical resources of the three organizations. It is the conviction and firm intention of the managements of all three companies that the local independence of each merging company shall be maintained to the fullest possible extent."

"We have three successful companies, here," adds Don MacBride, "and are continuing those conditions which made them successful. The only changes made are those necessary to permit us to live together. Should American attempt to operate the companies you risk losing the creative thinking and initiative of the people who made the

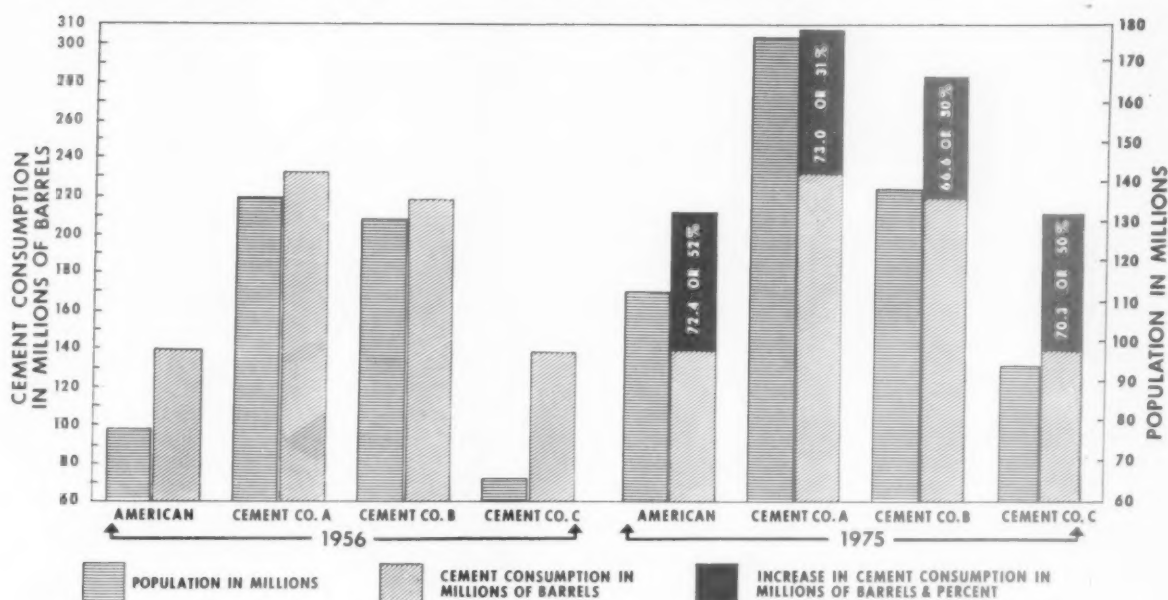
companies successful, and this we don't want to happen.

"The greatest risk we face is the pitfall of growing centralization. If it appears desirable to centralize certain past functions we will probably do so. But if there is ever doubt about whether or not to centralize a function, the doubt will be resolved in favor of independent operation. We're willing to take a few minor inefficiencies to preserve individuality."

Once agreement was reached among the top executives as to the form the merger should take, the mechanics of seeing it through were relatively easy and uncomplicated. Mr. MacBride agreed to serve as president of the new company, Mr. Beckett as Chairman of the Board, and Mr. Russell as Vice Chairman of the Board and Chairman of the Executive Committee. As might be expected, there were stumbling blocks, but they were overcome with a minimum of difficulty. Most of the problems revolved around a fair exchange ratio in issuing American stock to the stockholders of the three participating companies. Groups of engineering, financial and production people visited the plants of the three companies and carefully evaluated them. Considerations included: raw material reserves; condition of plants; capacity; debt; markets; balance sheet position; people; earnings and cash income over the past five years; and future potentials.

By almost every yardstick used, the results came out roughly the same. Riverside represented about half the value of the combined group, Peer-

American sees booming future sales in its marketing areas



less about 28.5 percent and Hercules, 21.5 percent. Accordingly, Riverside stockholders were given two American shares for each share of Riverside common, while a share of Peerless common merited 1.268 shares of American, and each share of Hercules common could be converted to 1.145 shares of American. There were surprisingly few dissidents among the shareholders. All differences with objectors have been readily and amicably resolved.

Percentage depletion also gave the merging partners some headaches. Both Riverside and Hercules had filed claims for refunds of federal income taxes based upon percentage depletion computed according to judicial interpretation applying to the cement industry. As the refunds are allowed, the former stockholders of these two companies will receive a proportionate distribution of common stock. There were other individual company differences that had to be discussed and disposed of. Peerless had a profit-sharing plan, while the other two didn't; the same thing was true of a Hercules stock-option plan. In each case, the decision was to let the individual companies continue to treat these problems individually—and that's the way it is today, and will continue to be.

On the other hand, Peerless operated on a fiscal year, while the other two companies used a calendar year. A change was indicated, so Peerless agreed to change.

"We of American have a complete mutuality of interests," says Bob Morrison. "As we're made up of fair-minded people, we endeavor to make deci-

sions in the best interests of everyone concerned."

American is ruled by a 21-man Board of Directors which includes 10 representatives of Riverside, 6 from Peerless, and 5 from Hercules. Much of the Board's routine work is performed by an Executive Committee—made up of MacBride, Beckett, Russell, Giles, Kinard, Morrison and Wm. Fulton Kurtz, Bigham D. Eblen and William G. Henshaw III, who are outside Board members from each constituent company—which meets every month.

How have things been going so far with American? Don MacBride laughs at this question. "The child is only six months old," he says, "and just beginning to gather strength. Give it time."

Yet, a surprising number of things have already been accomplished by American—and the future is bright with promise and enthusiasm.

"The industry faces a period of rapid growth. We hope to grow not alone through expansion of existing plants and construction of new plants, but through broadening our partnership," predicts MacBride. "We will continue to associate ourselves with growing markets. Southern California is the greatest, and we plan to grow with it. Arizona is another. Many sections of the country will experience healthy growth in the years ahead and we hope to grow with them."

Already American is underway with a new 1.6 million barrel plant at Clarkdale, Arizona, which will be in operation by fall 1959. The bulk of three

Please turn to page 122

Why wash aggregates?

Tougher specs., depleted reserves make it necessary

By WILLIAM A. RUNDQUIST

IN THE FACE OF CURRENT STANDARDS for clean, well graded aggregates—with even more stringent requirements to come—every producer ought to reappraise his present methods of washing and sizing to make sure that he can continue to meet specifications profitably.

For many producers, the processing of adequately washed and properly sized aggregates presents no serious problem. But those who in the past have got by with a "washing" that consists of a spray of water over a sizing screen are likely to find in the near future that something more will be needed.

State highway specifications for portland cement concrete aggregates show why further investigation of washing and sizing methods is necessary. Examples:

"Coarse aggregate shall be sound crushed rock or gravel or a combination of both. It shall be free from oil, organic matter and other deleterious substances.

"Regardless of source, all coarse aggregate shall be thoroughly and uniformly washed before delivery on the work and shall not be used in the work within 24 hr. after washing.



William A. Rundquist is vice president of Pioneer Engineering, Minneapolis, Minn. He is also a member of the board of directors of the National Crushed Stone Association and first vice chairman of the National Sand and Gravel Association. Mr. Rundquist is a graduate of the North Dakota State College School of Engineering and holds a B. S. degree in Mechanical Engineering.

"Fine aggregate shall consist of approved material and shall be hard and durable. It shall be free from oil and other deleterious substances and when tested in accordance with the Standard Method of Test for Organic Impurities in Sands for Concrete, ASTM Designation: C40, it shall not indicate a color darker than the reference standard color solution."

In addition, the specifications quoted above require that adequate stockpiles of both coarse and fine aggregates be produced and stored far enough in advance of construction operations to permit sampling and testing before use. Further, these specifications call for such tests as those for sedimentation (a test for the proportion of detrimental fine dust or claylike materials present in coarse aggregate) and sand equivalent (a test indicating the proportion of the same deleterious materials in soils or fine aggregates).

Nor is the element of water left to chance:

"Water for washing aggregates . . . shall be substantially free from oil. It shall not contain chlorides calculated as sodium chloride (salt) in excess of 3,000 parts per million nor sulphates calculated as sodium sulphate in excess of 2,000 parts per million."

Looking at specifications from another section of the country, we find that "all coarse aggregate shall be washed except that, if unwashed Class A aggregate shows a decantation loss which is less than the permissible amount, this class of aggregate need not be washed."

Here, Class A aggregate is defined as that which "shall consist of crushed trap, quartzite or granite quarry rock." In these specifications, however, there are definite limits on the quantities that may be present of such deleterious substances as soft red oxide particles, coal, soft or disintegrated rock particles, slate, clay balls or lumps, etc.

In these specifications, fine aggregate for portland cement concrete is defined as "a natural sand consisting of particles of sound, durable rock, except that when fine and coarse aggregates are produced simultaneously and by the same operations from natural gravel deposits, the fine aggregate may contain particles of crushed rock of such nature and quantity as are incidentally produced by the normal operations of crushing and screening the oversize material of the deposit."

Then this: "The fine aggregate shall be washed."

Washing bituminous aggregates. When washed aggregates are discussed, it is generally assumed that the materials for portland cement concrete are meant. Such an assumption is not always valid. In a central section of the country, the specifications for bituminous surfacing state that "gravel

for use as aggregate in this type of bituminous work shall be thoroughly washed and screened. It shall be free from clay or mud balls, sticks or other deleterious matter."

It is interesting to note that some states define fine aggregates for bituminous work as material passing a No. 10 sieve and retained on a No. 200 sieve; for portland cement concrete, as that passing No. 4 and retained on No. 100. In other areas and in federal specifications, the cut-off point between coarse and fine aggregates is No. 8 mesh. In still other sections, concrete sand is defined as No. 4 to No. 8 mesh, and masons sand as minus No. 8. Therefore, in setting up to wash or size fine aggregates, the producer must be sure of where and on what type of work his material will be used.

Not all areas, of course, require that bituminous aggregates be washed. However, in those areas where the mix must be processed from sub-marginal materials, the amount of contained silt and dirt is apt to exceed specified limits. Right now, the only economically satisfactory way to overcome the problem is to resort to washing of the fine aggregates. In the worst cases, the coarse aggregates must be washed too.

It has been fairly well established that as the highway program progresses, greater use of sub-marginal material on an area basis will be necessary to keep haulage costs within reason. So the trend is already shaping up: more washing of all materials.

Nor are quarry-operators immune to this trend. Rock will have to be quarried from beds as close as possible to the work being done. In many cases, quarries will be opened where silt and dirt are present in quantities exceeding specifications, and the under-par rock from these quarries will have to be washed.

Another trend is in the making. It is not unlikely that federal specifications eventually will deal more and more with expected results. There will be less emphasis on "how to do it" and more on what is expected. In order to take advantage of local source materials, it is quite probable that even "result" specifications will be prescribed on an area basis. As far as the highway program is concerned, both contractors and producers will have to give greater attention to the "why" and "how" of washing aggregates.

Plasticity index. Highway contractors are familiar with construction of flexible bases. Frequently the aggregates for such bases contain an excess of soil binder, which probably will result in an exceeding of the permissible plasticity index. The addition of sand or very sandy soil may make

Please turn to page 125



Sand is washed and sized as it passes over vibrating screen

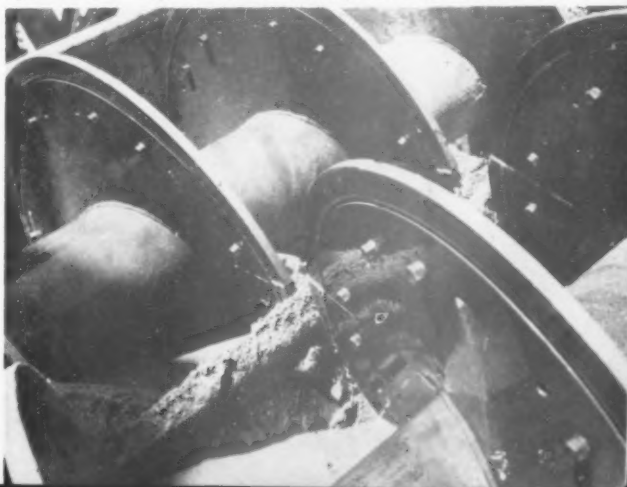
TABLE I. LIMITS FOR DELETERIOUS SUBSTANCES IN FINE AGGREGATE

	Maximum Percent by Weight of Total Sample
Clay lumps	1.0
Material finer than No. 200 sieve:	
Concrete subject to abrasion	3.0 (a)
All other concrete	5.0 (a)
Oven dry material, coarser than No. 50 sieve, floating on a liquid with specific gravity of 2.0	0.5 (b)
<small>(a) In the case of manufactured sand, if the material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, these limits may be increased to five and seven percent, respectively. (b) This requirement does not apply to manufactured sand produced from blast furnace slag.</small>	

TABLE II. LIMITS FOR DELETERIOUS SUBSTANCES IN COARSE AGGREGATE

	Maximum Percent by Weight of Total Sample
Clay lumps	0.25
Soft particles	5.0
Chert that will readily disintegrate (soundness test, 5 cycles)	1.0
Material finer than 200 sieve	1.0 (a)
Oven dry material floating on a liquid with specific gravity of 2.0	1.0 (b)
<small>(a) In the case of crushed aggregates, if the material finer than the No. 200 sieve consists of the dust of fracture, essentially free from clay or shale, this percentage may be increased to 1.5. (b) This does not apply to blast furnace slag coarse aggregate.</small>	

Spiral classifier separates fines from larger sand grains





Sand preparation plant and primary screening tower. Sand classifying system recovers fines from primary screen tower by gravity



Secondary screens, located high in the tower, add capacity to the storage system



Efficient vertical flow of material is a definite design feature. Material passes from bottom dump to primary belt conveyor through a feeder, impact crusher and short belt feeder



Tie your Here are six installations

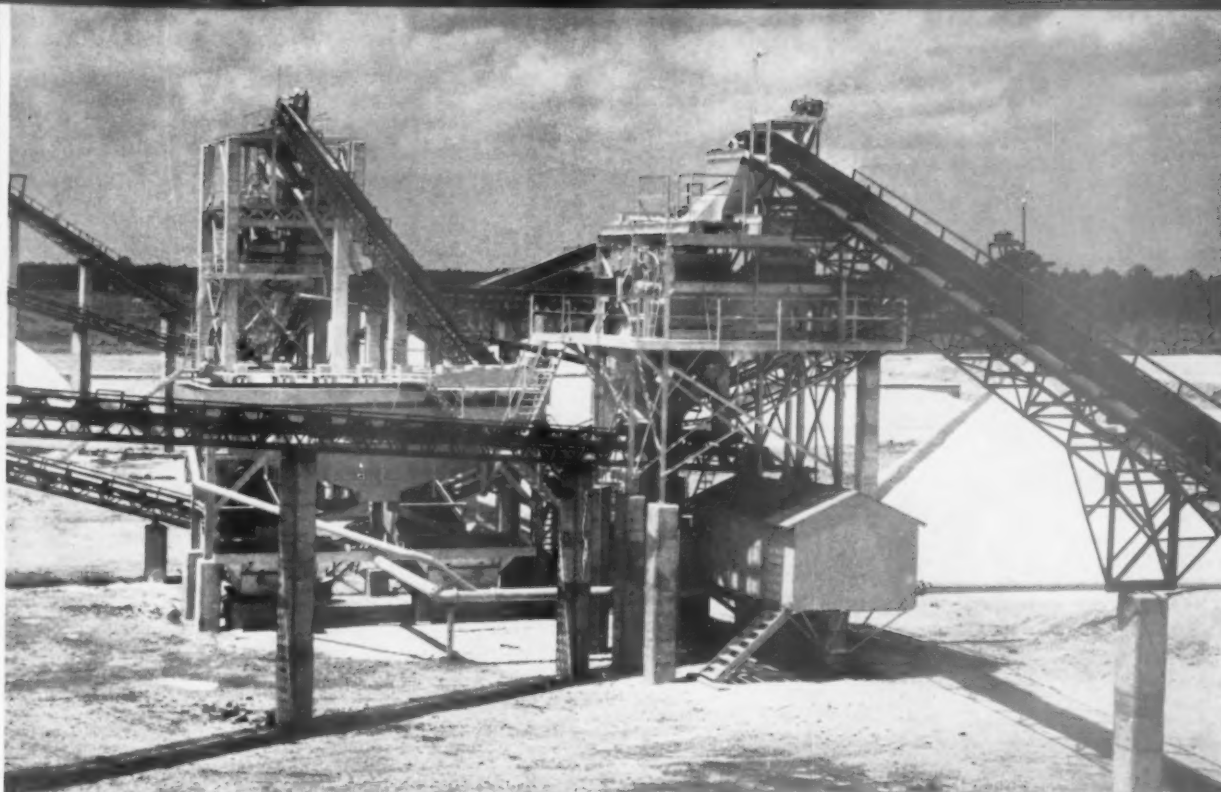
By WALTER B. LENHART

THE NEW PLANT of the Oolite Crushed Stone Co., Miami, Fla., uses some of the latest equipment in the field—including a hydraulic scalper—to produce 400 tph. of crushed stone and sand.

The plant, in operation since March, 1957, is 21 miles southwest of downtown Miami. Designed and built by the company, it is served by a spur of the Seaboard Railroad.

The oolite rock which underlies this section of Florida is typical of coral-derived varieties—hard and white in color, with excellent properties for concrete and concrete products uses. Nine sizes are normally processed by the Oolite plant, the latest expansion in an operation which includes two ready-mixed concrete plants owned by the affiliated Oolite Concrete Co.

Stripping is done by a second affiliate, the Oolite Rock Co., and usually extends to within a foot of the water tables in the area. The material here is considerably harder than the surface rock and must be drilled and blasted.



Overall view of the plant showing primary screening and secondary screening

efficiency to equipment selection

that give Oolite producer greater productivity

In the blasting operation, Oolite uses a rotary drill which provides a 3½-in. diam. hole for ammonium nitrate, "fertilizer-type," explosives, detonated with semi-gelatin and detonating fuse. All holes are drilled below water on 14-ft. centers and 14-ft. burden, and the explosive is protected from moisture by wax cylinders. It takes 45 min. to drill through 50 ft. of rock and to load the hole through a tube.

About 2 cu. yd. of rock is secured per pound of explosives. The blasted rock is excavated by a 5-cu. yd. walking dragline and piled in windrows beside the pit to drain. Four 13-cu. yd. bottom dumpers, loaded by power shovel, move the rock to a 25-ton live load hopper at the plant.

A wobbler feeder under the hopper screens out the fines and moves the oversize to the primary crusher, a double-rotor impactor. This combination of wobbler and impactor gives a high initial capacity at low horsepower input. Below the wobbler-impactor assembly is a 42 in. wide flat belt conveyor which carries the raw fines and crushed material to an inclined 36 in. wide belt conveyor.

This conveyor serves the scalping or primary screening section—two 5 x 12-ft. double-deck vibrating screens. The top deck of each screen feeds coarse material to a secondary crusher, which also receives some plus rock from the final screening

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MAJOR EQUIPMENT USED AT OOLITE CRUSHED STONE CO.

In pit operations:

Rotary drill	Schramm, Inc.
Fertilizer blasting explosive	Hercules Powder Co.
Detonating fuse	Ensign-Bickford Co.
Walking dragline, 5 cu. yd.	Page Engineering Co.
Shovel, 1½ cu. yd.	Northwest Engineering Co.
Bottom dump-trucks, 14 cu. yd. (4)	Euclid Division, GMC

At the plant:

Wobbler feeder	Universal Engineering Corp.
Primary crusher, impactor	
Secondary crusher, impactor	
Vibrating screens, 5 x 12 ft. (3)	Allis-Chalmers Mfg. Co.
Vibrating screens, 5 x 16 ft. (2)	
Screen, 4 x 14 ft.	Iowa Mfg. Co.
Screen, 1½ x 6 ft.	W. S. Tyler Co.
Water scalper	Eagle Iron Works
De-watering spirals (2)	
Conveyors	Continental Gin Co.
Conveyors	Link-Belt Co.
Conveyor belts	Hawitt-Robins
Tractor shovel, 2½ cu. yd.	Frank G. Hough Co.
Clam shovel, 22-B.	Bucyrus-Erie Co.
Tractor, D-8	Caterpillar Tractor Co.



Sizing and washing operation is at left, and sand classifier at center

Here's what a Canadian sand and gravel firm faced:

Problem: rigid specs., no water

Solution: unusual classifier, new

LIKE CAREFUL HOUSEWIVES, Canadian concrete products producers go to market these days with their minds made up. Their specifications for concrete block and ready-mix aggregates are exacting, and no amount of persuasion can change them.

As a result, aggregates producers must prepare their products more carefully. Better material must be made, yet peak capacity and competitive prices must be maintained.

Concrete products producers in Toronto's competitive building market insisted on a washed sand without the minus 100-mesh sizes. For Ross and Bruce Winterstein, operators of Stouffville Sand and Gravel, Ltd., this was a major challenge. Their deep reserves of well-graded sand and gravel, near Stouffville, Ont., had no steady supply of water.

Existing washing equipment could not remove enough of the fine sizes nor maintain a high enough production.

Their solution: a new 250-tph. aggregates washing plant near Vandorf, Ont., six miles from the deposit, where a small spring-fed lake could maintain a dependable supply of water. At the new plant, set up during the 1957 season, plenty of space was available to stockpile aggregates from the Stouffville pits and to store washed sand and gravels. A large acreage permitted a system of tailing ponds and the disposal of rejected fines as fill. If minus 100-mesh sand is ever needed, the fill material will always be readily available for recovery and processing.

While the new plant was set up primarily to produce washed sand, it yields three sizes of washed



Portable plant in the pit reduces gravel minus 1 in. Trucks then carry sand and gravel six miles to lakeside plant

By ELWOOD MESCHTER

lakeside plant

gravel in addition. The raw gravel has already been reduced to minus 1-in. at the pit by a portable crushing and screening unit.

The heart of the new plant is the 15-ft. diam. rotary sand classifier. This unit makes a sand just right for block producers from the 3/16 in. x 0 or 3/8 in. x 0 fine material sluiced through the vibrating screen. This sand is picked up by the classifier on a series of helical segment plates. As the plates rotate, the sand is elevated above the water level, which is controlled by weirs. The dewatered material is plowed off to a belt conveyor and taken to storage.

About 800 gpm. of water is used to separate the sand from the gravel on the vibrating screen. The amount of fines retained in the classifier can be controlled by changing this volume of water, while

the amount of water in the finished sand can be controlled by the elevation of the weirs along the outer edge of the classifier.

Sand is stored under an elevated flat belt distributing conveyor which makes two piles, each about 30 ft. high. As one pile is building up and draining, shipment is made from the other pile using a tractor shovel to load trailer trucks.

Raw aggregates for processing in the plant are stored near a truck dump hopper. This surge pile permits the washing plant to operate continuously, independent of the gravel pit. A clamshell loads the rear dump trucks which keep the hopper full, providing the materials to keep the washing plant running.

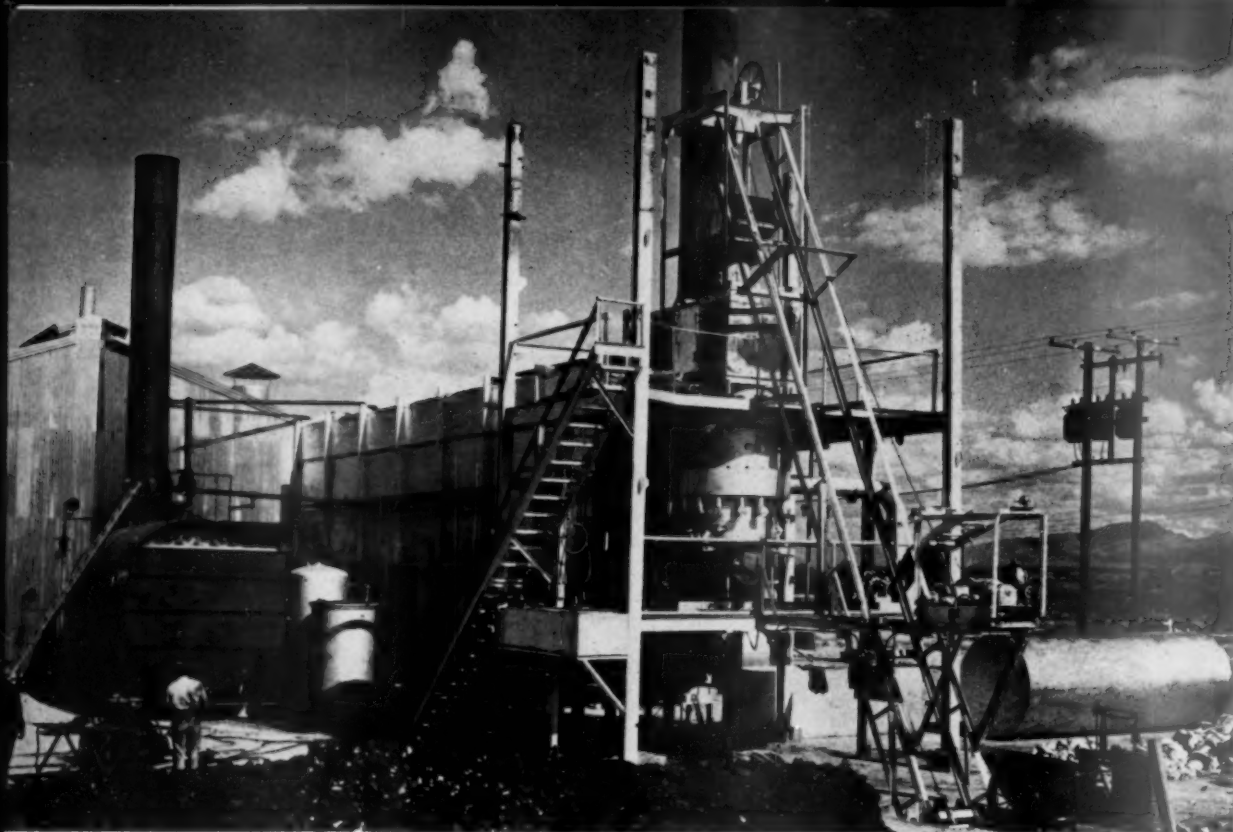
A reciprocating feeder under the hopper feeds a long inclined belt-conveyor, which elevates the aggregates to a three-deck 5 x 12-ft. vibrating screen. Three sets of nozzles spray the top deck of the screen, effectively stripping the sand from the gravel and washing it down to the classifier.

While the screen cloths can be changed readily to make any size of washed gravel below 1 in., the most common gravel sizes are plus 7/8 in., 5/8 x 7/8 in. and 3/8 x 5/8 in. Each size is stocked out with

Please turn to page 130

Blade in classifier plows off desired sand. Turbulent water inside carries away minus 100 mesh fines





Boiler, rectangular settling chamber, cupola and inclined skip hoist show in this view of business end of the plant

Wollastonite spun into rock wool

Pioneer operation makes insulation from former novelty

By V. C. DOCTORMAN*

AS THE FIRST STEP in a program to utilize its varied mineral resources, a California limestone producer has begun to make rock-wool insulation from wollastonite.

This rock, a calcium meta-silicate, has no loss on ignition and unvarying chemical composition. It used to be only a mineral novelty with no industrial value. Now it is being turned into spun fiber in new Blythe, Calif., plant of Woolstone, Inc.

There are only two commercial-grade deposits of wollastonite in the Western hemisphere. The larger of these is here in the Maria mountains, 10 miles from the Blythe plant, and is owned by California Limestone. This deposit has visible, open-pit reserves of more than one billion tons of high-purity mineral.

Since there is an abundance of float material available which will have to be cleaned up before

a quarry face in the mineral can be developed, actual quarrying operations have not begun. The deposit will be opened in 10-ft. benches, shooting the material down by a shot-hole pattern best adapted to produce relatively small chunks for the crusher. The compact, fibrous wollastonite is available to Woolstone, Inc., in crushed and sized form.

At the quarry material is loaded by a crawler-mounted front-end loader into dump trucks of 10-ton capacity and transported to the crusher, located at the plant site. There, trucks discharge into a feeder bin over the crusher. The broken material, sized to about 5 x 1 in., is moved to the material yard on a 24-in. wide inclined belt conveyor. A vertical water-cooled cupola, 48 in. diam., is used for melting the raw material, with raw stone and coke lifted to the top of the cupola with a small skip hoist.

*Consultant to Woolstone, Inc.



Batt production line, left, and bagging operation, right, shown inside 80 x 220-ft. plant building

Under the cupola is a dual-disc spinner which fiberizes the melted wollastonite. This machine is equipped with two 7-in. discs which can be revolved in a great range of speeds, making the spinner adaptable to slags of varying types. The discs can be changed readily to meet different conditions in cupola operation.

Final processing. The molten material from the slag notch is immediately divided into two streams and dropped on the revolving discs. On contact with the discs, the material is broken up into small droplets and thrown radially outward to the perimeter of the disc. Here it is caught up by high-velocity steam from a steam necklace surrounding each spinner head and propelled straight forward. The shearing action of the steam fiberizes the droplets and projects the resultant wool into the settling chamber.

When the spun fiber is discharged into the end of the settling chamber nearest the cupola, it is carried to a granulator, or tufting machine, by a 12-in. screw conveyor. This granulator is similar to a threshing machine, breaking up the fiber. As a result in the next stage, a revolving screen, particles of unfiberized material are more easily removed. Leaving this screen, the wool is picked up from an apron conveyor, lifted by air suction and discharged into the "hickey" separator, a device for further cleaning which uses the principle of gravity separation. From the hickey separator the wool enters either tube of the volumetric bagger, operated by pneumatic rams.

Batt forms of insulation are produced by pass-

ing the felted blanket through a drying oven and a batt wrapping machine. The oven used at the Blythe plant is built to handle felted blankets up to 10 in. thick, compressing them to a density of 12 lb. per cu. ft. The batt wrapping machine is a new type which handles vapor barrier paper on top; asphalt flows by gravity, eliminating pumps. A pneumatic packer places the finished product in paper containers.

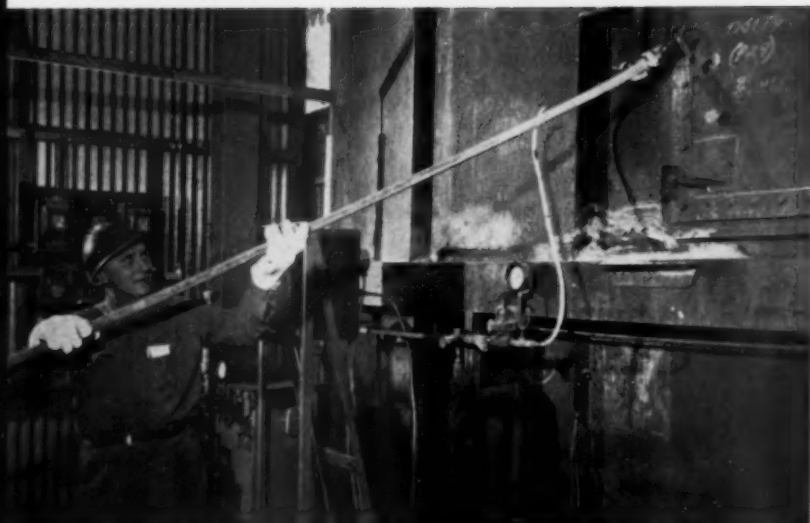
California Limestone Products Corp.'s greatest potential growth lies in the field of nonmetallic minerals. The new rock-wool plant is the first of several industrial installations planned by this corporation to utilize its resources in the Maria mountains. Planned undertakings include a modern lime-burning plant, a cement plant and the opening of a marble deposit by quarrying.

Maurice Willows, manager of the Blythe plant, is secretary-treasurer of California Limestone and holds the same office in Woolstone, Inc. Ralph S. Hall is president of both companies.

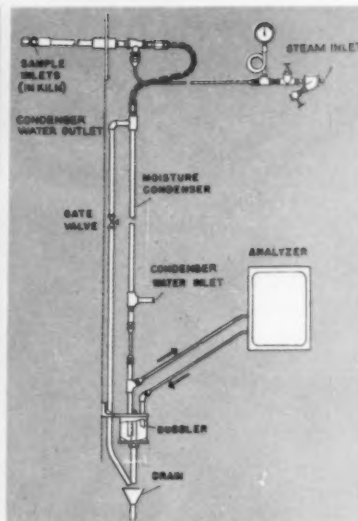
END

MAJOR EQUIPMENT USED BY WOOLSTONE, INC.

Front-end loader	Lull Mfg. Corp.
Dump truck, 10 ton capacity	U. S. Army
Crusher, 12 x 24"	Allis-Chalmers Mfg. Co.
Belt conveyor, 24 in.	
Cupola	Specially Built for Plant
Skip hoist	
Dual-disc spinner	
Hickey separator	
Bagger	
Drying oven	Richardson Services, Inc.
Batt-wrapping machine	
Granulator	
Pneumatic Packer	
Screw conveyor, 12 in.	Link-Belt Co.
Apron conveyor	



Sampler probe, here being removed for cleaning, is made long to project well into kiln



Steam draws gas from kiln, is then condensed. Next gas is separated from condensate and analyzed

Steam licks gas sampling problem

Clogging reduced in gas sampler at Dragon Cement Co.

DRAGON CEMENT Co., Siegfried, Pa., licked its kiln gas sampling problems with a system that uses live steam to prevent clogging.

The advantages of automatic kiln-gas analysis are well known, but fine particles of raw feed material, clinker dust and alkali fume readily clog ordinary sampling probes. Naturally, the finest analyzer is useless if it can't obtain a suitable gas sample.

The sampling unit is actually an aspirator mounted at the end of a probe, located at the feed end within the rotating portion of the kiln. Live steam, supplied by a compact steam generator, is used to draw the gas sample into the sample probe. The continuous presence of live, superheated steam at the probe prevents condensate formations which, together with dust, would clog the sampling system. The steam and gas-sample mixture is forced through a water-cooled pipe to the outside of the kiln. There a water-cooled condenser at the analyzer separates the steam from the gas sample. Thus, most of the time, only a dry gas sample is allowed to pass through the analyzer.

The probe, a magno-therm oxygen analyzer and an electronic recorder were installed and put into operation in June, 1955. This method has practically eliminated the sampling problems at Drag-

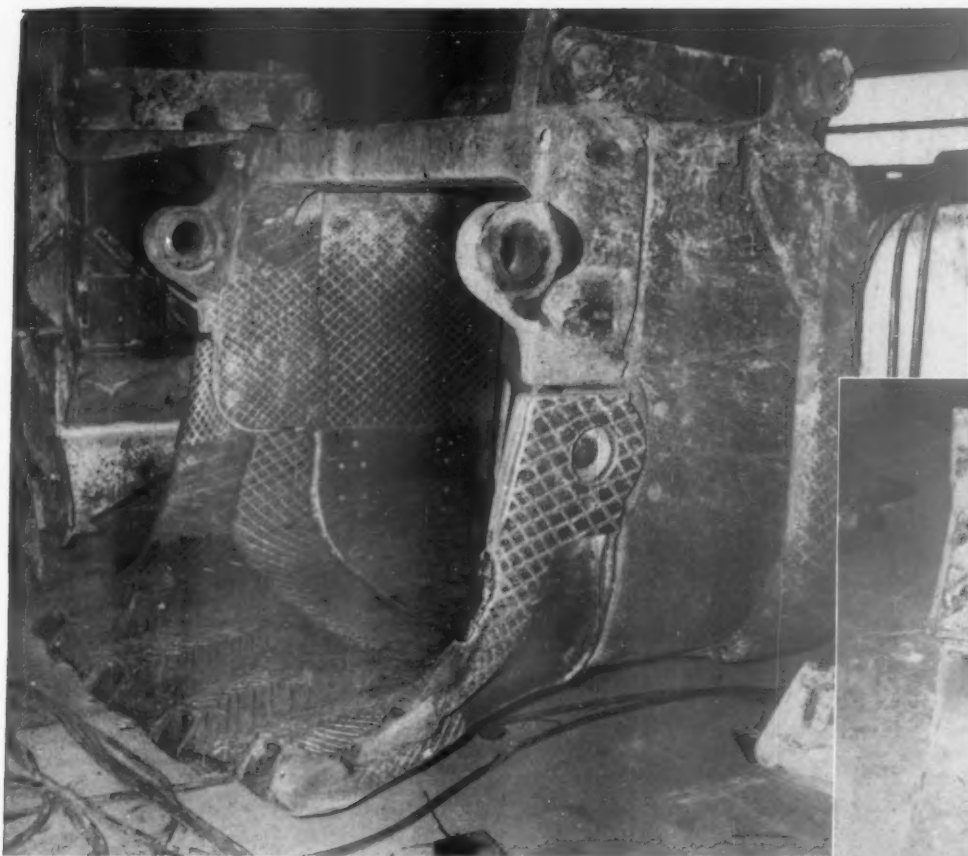
on Cement. The first probe put into operation had a period of 53 days' continuous service before it was cleaned. Subsequently installed systems on other kilns at the plant have worked out as well or better.

One reason for the success of this system is its simplicity. The gas sample passes from kiln to analyzer without restriction of valves or other items which could produce a point of dust buildup. The straight-through condenser and bubbler-type moisture separator further assure a well-conditioned sample for the analyzer. Since only steam comes in contact with the sample prior to analysis, no error due to liberation of oxygen from operating water is involved. A true gas sample is analyzed.

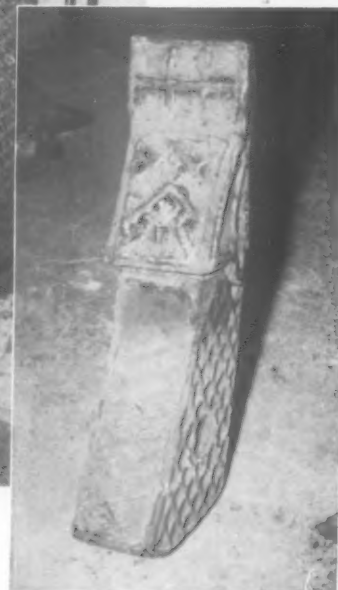
The operator can now observe directly the percentage of excess air present in kiln combustion gas. Excess air is held between two and four percent, equivalent to $\frac{1}{2}$ to 1 percent oxygen, through adjustment of the fuel-air ratio. Variations of less than .2 percent excess air are detectable on the oxygen recorders.

As a result, savings were effected in fuel consumption as well as in reduced kiln maintenance. Adding the increased kiln output possible as a

Please turn to page 119



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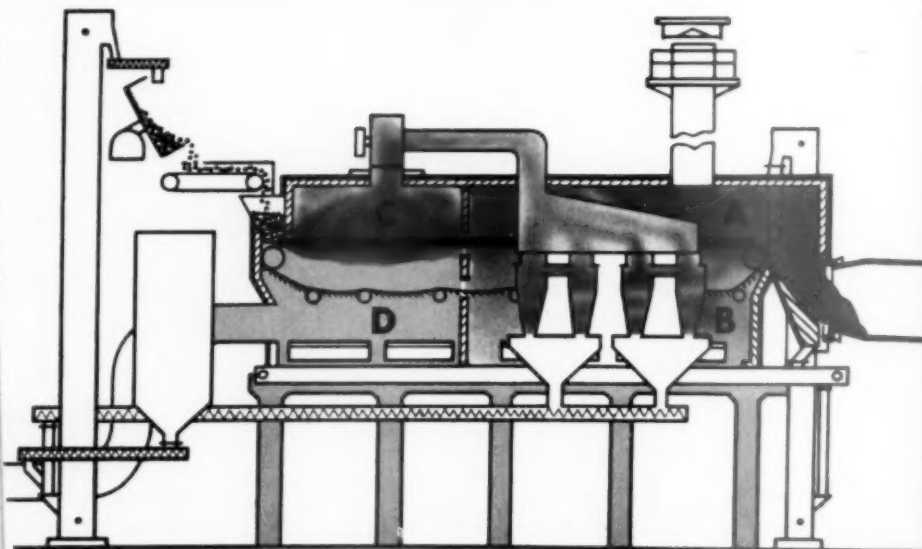
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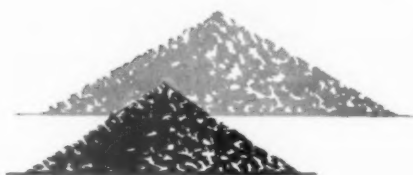
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**40% less fuel
per barrel
of clinker**

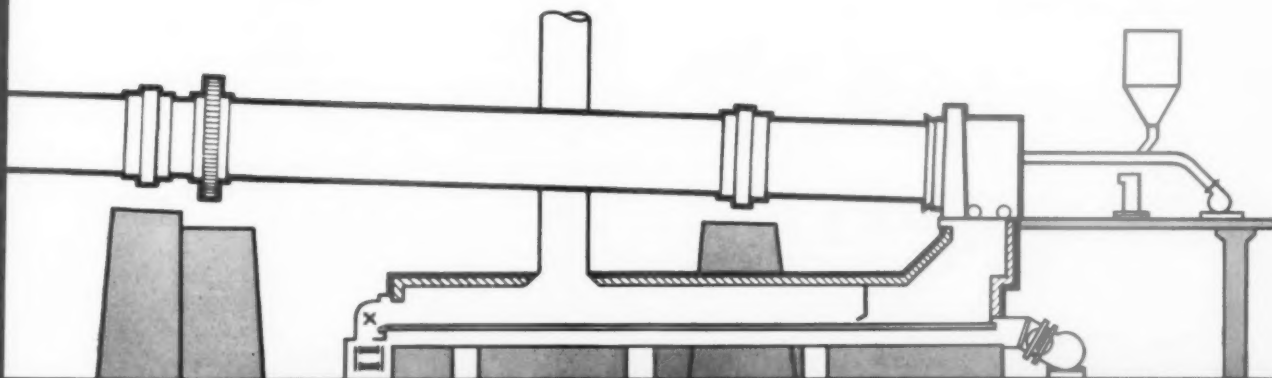
ACL systems now in operation consume fuel at an average of 600,000 Btu per barrel of clinker. Compare this to fuel requirements of conventional long, dry-process kilns which use from 800,000 to 1,000,000 Btu. And the *ACL* double-pass system is designed to use any conventional fuel—powdered coal, fuel oil, natural or coke oven gas.

For details, ask your A-C man for a copy of Bulletin 07B8431. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

How the *ACL* double-pass system works

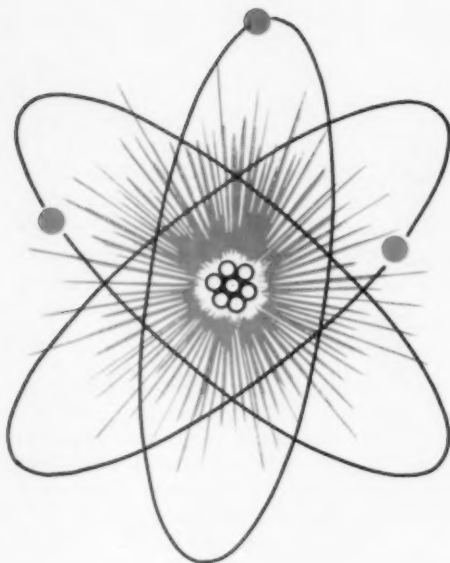
Partial calcining and dust reclamation take place as hottest gases pass through pellet bed on traveling grate. Gas temperatures are reduced from about 1800 to 500 degrees in this first pass (A to B). Next, gases pass through cyclones where larger dust particles are

removed, and carried back to pelletizer. Final dust filtering takes place as gases pass through moist pellets on feed end of grate. In the second pass (C to D) gas temperatures are reduced more. Heat of kiln gases is transferred to material.



ALLIS-CHALMERS





Isotopes— potential new tools for rock industry

By LEO WALTER

**New uses are being found
for radiation techniques**

RADIOACTIVE ISOTOPES are now readily available in all industrialized countries, and an ever increasing number of manufacturers and processors have become aware of the impressive range of actual applications of isotopes which have been reported. Certain qualities of each isotope may be applied to solve particular problems, and these isotopes have become valuable new tools for industry.

A radio-isotope is a chemical element which has been bathed in radioactivity in an atomic pile. It acquires radioactive properties which it then proceeds to emit as radiation until expended. The power of radioactive rays is measured in curies, related to the penetration or "punch" of the radiation. Punch is determined by the type of radiation, electrons, alpha, or gamma ray. The rate of expenditure of an isotope's radioactivity is measured in terms of its "half-life," that is, the amount of time until half its radioactivity is exhausted. Table A lists several of the available radio-isotopes with their half-life.

Three factors determine the use of any isotope:

- The "punch," or penetration power of the isotope's emissions.
- The length of its "half-life." It may be too short to be practical or take too long in the atomic pile to be economical.
- Availability and cost of the radio-isotopes. There are about 60 to 70 useful isotopes, but only specialists are using many of them.

Radioactive materials emit electrons and gamma rays. Atomic piles (and atomic bombs) emit electrons, gamma rays and neutrons. The neutrons are not only lethal but induce radioactivity in things they contact, thus they contaminate metals, earth, water, by making them radioactive. Gamma rays are also lethal but are not retained by the media they contact or pass through. Electrons (or beta rays) are not lethal but can hurt the skin.

Radio-isotopes used industrially rely on gamma or beta rays for their penetration; they cannot emit the deadly neutrons. When safety measures are observed, the use of approved industrial isotopes is without danger.

The greatest industrial use of radio-isotopes, by

Please turn to page 90



the
KENNEDY

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The Air-Gravity Conveyor
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Porous Tile Conveying Surface

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Air-Float thus offers
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- There are no moving parts—nothing to wear—nothing to maintain
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- Operates quietly—has high capacity—requires little headroom
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- Permits flexible design—directional changes are simple
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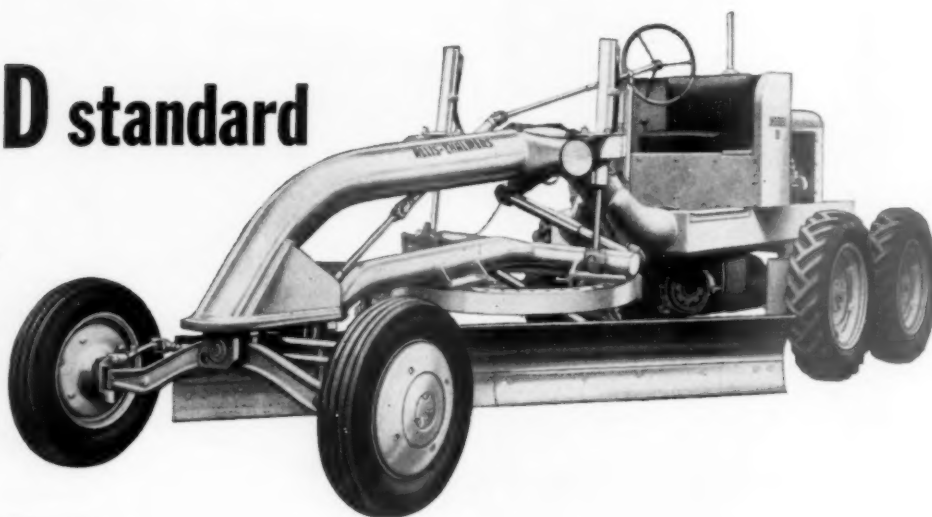
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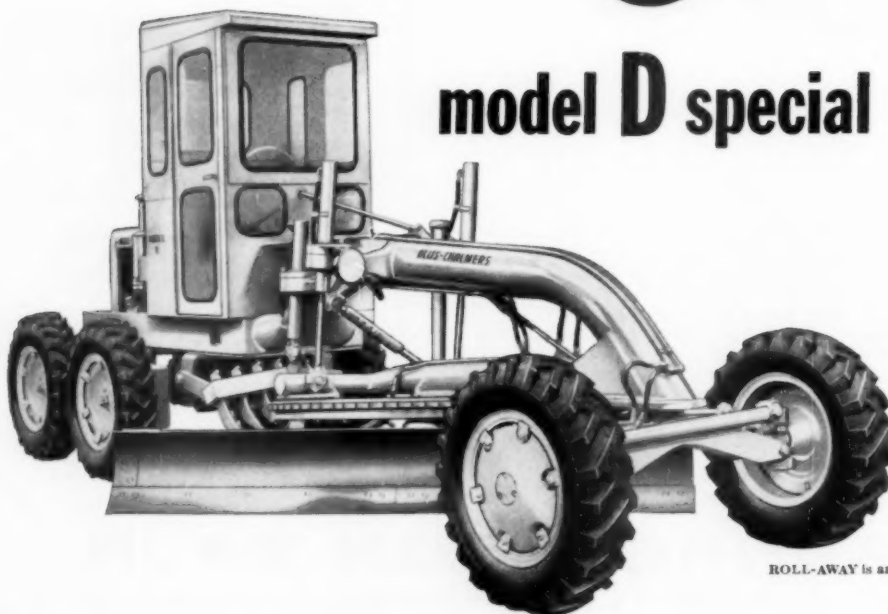
model D standard

50 hp
Approx. weight
8,800 lb (gasoline)
Approx. weight
9,350 lb (diesel)



model D special

50 hp
Approx. weight
10,900 lb (gasoline)
Approx. weight
11,450 lb (diesel)
4 forward speeds to 25
mph (approx.)
1 reverse speed to 3
mph (approx.)
All-steel cab*
Shiftable moldboard*
Hydraulic scarifier*
Leaning front wheels*
Power circle turn*



*Also available with
the model D standard as
optional equipment.

ROLL-AWAY is an Allis-Chalmers trademark.

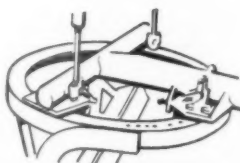
and construction work

MODEL D MOTOR GRADER

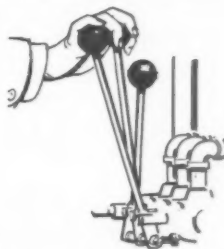
many production-boosting advantages



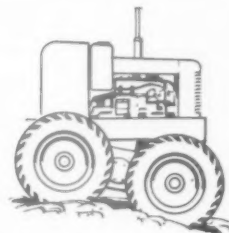
The ROLL-AWAY moldboard rolls dirt up and ahead to eliminate packing, reducing friction . . . gives you more performance per horsepower, more production per gallon of fuel.



Revolving circle and heavy tubular drawbar provide exceptionally stable moldboard mounting.



Convenient hydraulic controls, easy to operate. Two levers fit into one hand to control circle lift.

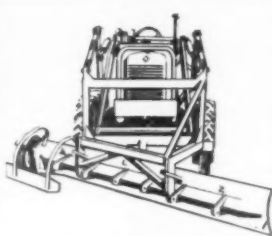


Positive tandem drive gives you four driving wheels under the heavy end of the grader.

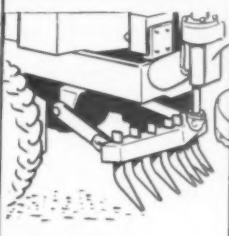
many job-multiplying attachments



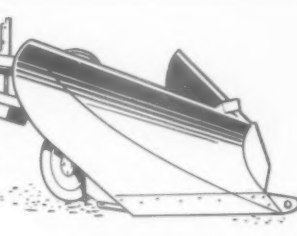
5/8-yd rear-mounted loader



Interchangeable shoulder maintainer



Midship-mounted scarifier



Blade and V-type snowplows

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

Look ahead...*move ahead*...and stay ahead

with **ALLIS-CHALMERS**



TABLE A
RADIO-ISOTOPES GENERALLY AVAILABLE FOR INDUSTRIAL USE

Isotope	Half-life	Useful radiation	Uses
Antimony 124	60 days	Gamma mixed	Tracing and process control in the oil industry
Cerium 144	290 days	Gamma mixed energies	These are the main, long-lived residues from atomic piles now being tested for food sterilization and similar applications
Caesium 134	33 years		
Carbon 14	6,000 years	Low energy beta	Widely used research tool in biological studies
Cobalt 60	5.3 years	Penetrating gamma	Radiography of thick materials, in the cobalt "bomb"; food sterilization; oil pipeline tracing
Iridium 192	70 days	Low energy gamma	General purpose industrial radiography and used in corrosive gauge
Phosphorus 32	14.3 days	Penetrating beta	Research on bone growth and fertilizer action
Radium	1,660 years	Mixed energy gamma	Used for luminous paint and static elimination
Sodium 24	14.8 hours	Very penetrating gamma	Radiography of very thick materials, and tracer work where rapid decay is essential
Strontium 90	25 years	High energy beta	Heavy sheet thickness gauges; medical use—external radiation
Thallium 204	2.7 years	Medium energy beta	Thin sheet thickness gauges

Isotopes for industry

continued from page 86

far, is as tracers. The radioactive material can be used to follow the movement of a mass of material or fluid. It is used particularly to "mark" oil flow through pipelines, where a single pipeline is used to carry a variety of crude oils.

The true application of radioactive tracers is to "label" other atoms and molecules so that their path can be traced through various reactions, mechanisms or processes. The method is extremely sensitive and extreme dilutions of radioactive materials can be employed for this purpose. Even with radioactive materials having a very long half-life, sensitivity of detection is superior to chemical or spectroscopic analyses. The unique property of a radio-isotope is that chemically, the material behaves in an identical manner to the non-radioactive isotope of the same element.

The radio-isotope cobalt 60 has been reported as an indicator to measure the wear of blast furnace refractory linings. This metal was embedded in the furnace lining at a critical depth and dropped out during an allotted amount of wear. The radioactivity was detectable through 2 ft. of furnace wall and its absence was immediately noticed. Caesium 45 has been used in firebrick composition for investigations of contamination of steels from refractory materials. As little as 10 millicuries of radioactivity can be detected in a batch of 300 tons of steel, indicating the sensitivity of this technique.

Silt movements in the bed of a river can be followed for miles and over a period of weeks by using glass powder containing scandium 46 as radioactive sand.

Industrial mixing processes of all kinds can be checked as to their efficiency by the addition of minute quantities of radioactive material. A tenth of a gram of common salt can be irradiated for half a day to induce enough sodium 24 activity to label a ton of cattle food. After mixing, measurement of the activity of the products will indicate the degree of uniformity and the efficiency of the mixing. The half-life of sodium 24 is 15 hours, particularly suitable for these tests because its radioactivity decays in a few days to a negligible and completely harmless level.

For this reason, radioactive sodium has been chosen to locate leaking joints in newly buried water mains. A radioactive solution is introduced into the main before it is raised to the operating pressure. After a period to allow the solution to penetrate any leaks into the surrounding soil, the solution is replaced with clear water. The leaking joints are found by detecting the residual activity in the soil with a counter inside a metal probe. The radioactivity is allowed to decay to a negligible level before the main is put into service, but it is interesting to note that the original radioactive

Please turn to page 93

27ton

"EUC" REAR-DUMP

*It's new...but
JOB PROVED!*



325 or 335 h.p. . . . Torqmatic Drive . . . 18.00 x 25 tires

Model R-27 is a new size in the complete line of Euclid Rear-Dumps—rated payload is 54,000 lbs. This off-highway hauler incorporates the job-proved components which have made Euclid Rear-Dumps the outstanding choice of contractors, mines and quarries.

With either 325 h.p. GM diesel or 335 Cummins engine, Allison Torqmatic Drive makes maximum use of the power for faster hauling cycles. Converter lock-up in the 4-speed Torqmatic permits 34 mph speed with full payload and efficient performance on long, high speed hauls.

Standard 18.00 x 25 tires on all four wheels assure the traction and load carrying capacity needed for moving 27-ton payloads on tough hauls. Standard body is rated at 18 cu. yds. struck—quarry type body is also available. The R-27 is equipped with oil retarder for safer, more economical braking on jobs with steep down-grades on the loaded haul.

See your Euclid dealer for detailed specifications on this new 27-ton Rear-Dump . . . it's a good example of the advanced design that makes Euclid your best equipment investment.

EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio

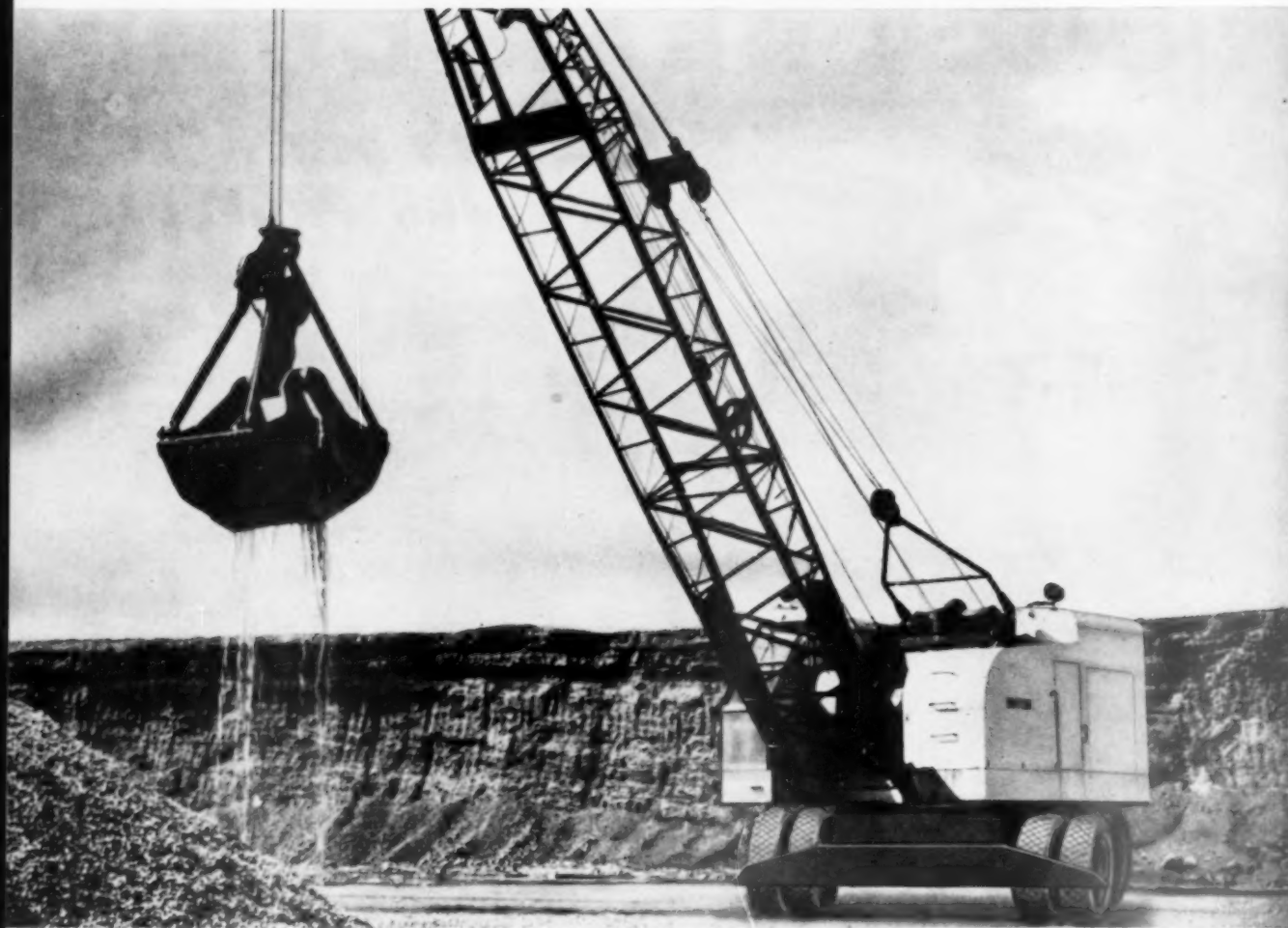
**A complete line of Rear-Dumps—10, 15, 18, 22, 27, 40 and 50 ton capacities,
also semi-trailer models of 12, 22 and 35 ton payload—to fit any job.**



EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

for aggregate handling, use
orton
experience



EXPERIENCE means a great deal . . . especially at ORTON where "production-line" manufacture is maintained only so long as the cranes on the line are engineered to the latest, proved design for your job. For, since Orton can't build all the cranes, it builds only the best.

ORTON, first with Torque-Control, first with air-operated controls, first to apply new techniques which have been proved, is also the first to recognize that each handling job

is unique, thus, an ORTON crane is built for you—your job—your specification.

Consider ORTON first—it is first.

EVERY ORTON CRANE has:

- ... ALL power shafts carried on sealed anti-friction bearings—NO exceptions.
- ... ALL motion entirely independent.
- ... NO jaw clutches—not even in travel mechanism.

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THE MOST POWERFUL NAME IN CRANES

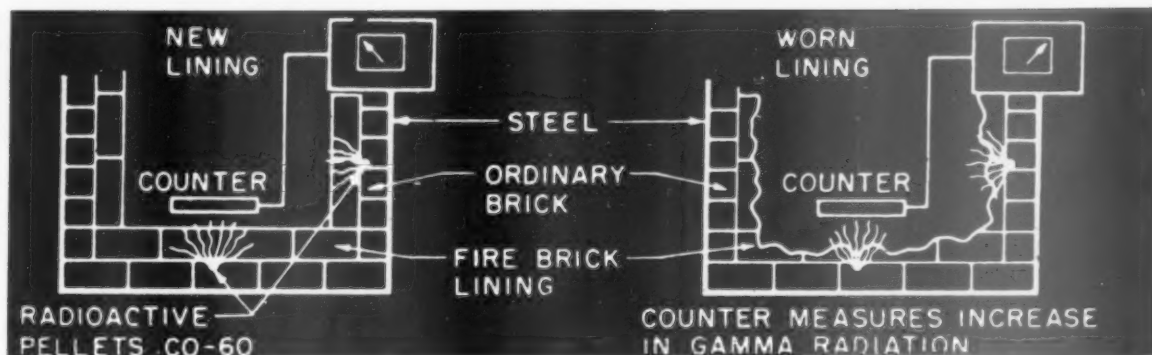


Fig. 1. Gamma radiography testing wear of refractory lining. When lining becomes worn (right), the counter measures a noticeable increase in radiation

Isotopes for industry

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solution need contain no more than one-tenth of that which is stated by international authorities to be safe for human consumption.

In a recent development, this method has been used in long oil pipelines. Leaks are detected from inside the pipeline by a self-contained detector and wire recorder which are towed along with the flowing oil. When the detector unit is removed at the end of several miles of pipeline, the wire recorder is "played back" and registers the position of any leaks in the section under test.

Radioactive tracers can be used to determine the paths of dusts and other particles which may cause health hazards in factories or mines. In many cases the dust itself can be made measurably radioactive. If this is not possible, an easily evaporated organic chemical, such as ethylene dibromide, may be used. The radioactive material is evaporated or blown into the air at the point at which the objectionable material originates and its distribution throughout the room or space involved can be plotted with a portable Geiger counter. For more accurate work a small vacuum cleaner can be used to suck known volumes of air through an absorbent filter and the filter removed for accurate examination at the end of each sample. In this way the efficiency of air filters in the laboratory and under operating conditions in cement and crushed stone plants may be checked.

Radiations are detected with Geiger counters, or with scintillation counters, which are specially suitable for the detection of gamma rays. This instrument is capable of recording up to 100,000 or more gamma radiations per second. The detectors feed electrical pulses, corresponding to the arrival of radiations, into electronic recording systems which either record the total number of

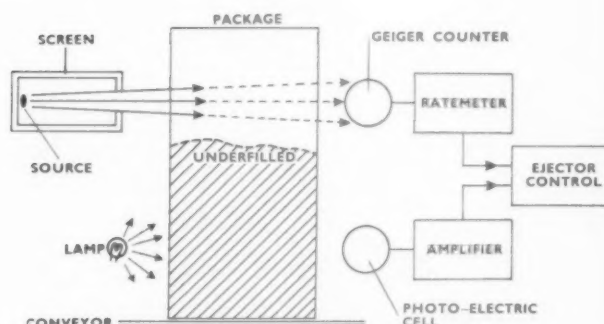


Fig. 2. Gamma radiation may be used to detect under-filled or overfilled containers of solid materials during packaging and conveying. With the source located on one side of the container and the detector on the other, maximum signal is recorded when the source is higher than contents of the package

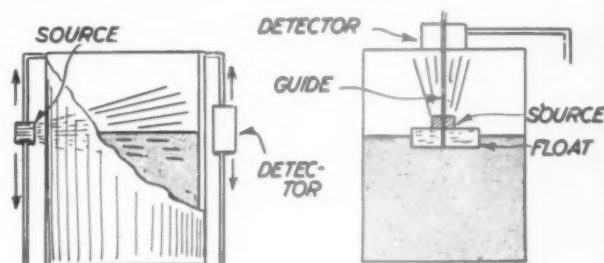


Fig. 3. Isotope-level gauge determines the surface level in container of liquids. Right drawing shows the source mounted on a float within the container

radiations arriving in a period of time or indicate their rate of arrival on a meter.

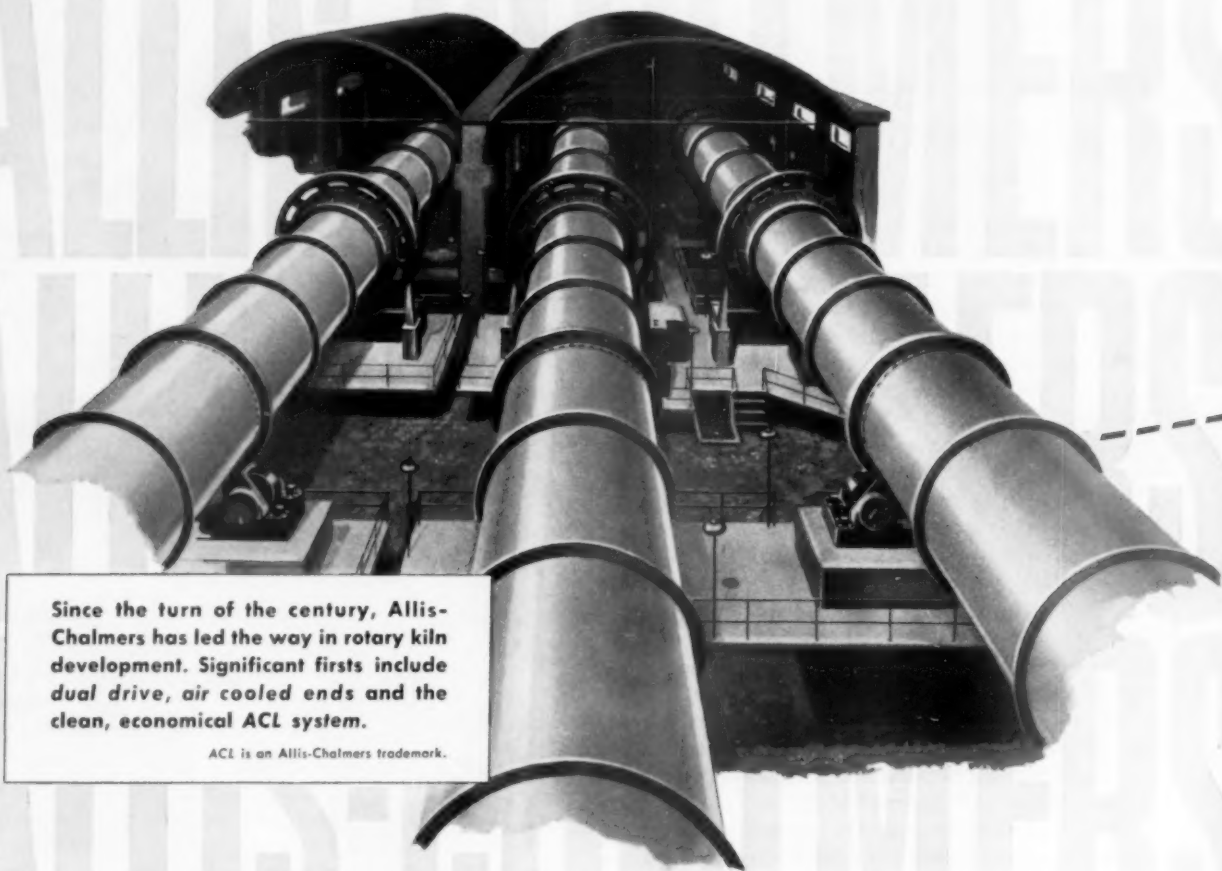
Facilities for the safe handling of industrial isotopes vary widely with the type of material and its specific application.

The aim of any protective measure is not to prevent exposure as such, but rather to keep exposure

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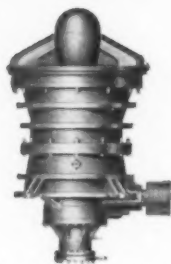
ALLIS-CHALMERS

Specialized Equipment for Every Industry

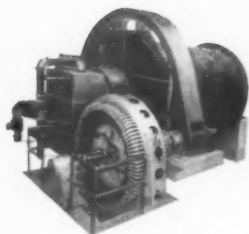


Since the turn of the century, Allis-Chalmers has led the way in rotary kiln development. Significant firsts include dual drive, air cooled ends and the clean, economical ACL system.

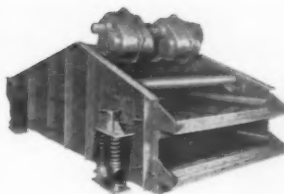
ACL is an Allis-Chalmers trademark.



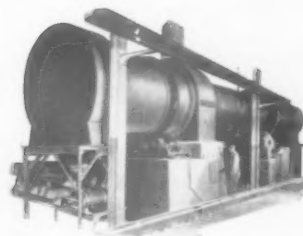
Gyratory Crushers



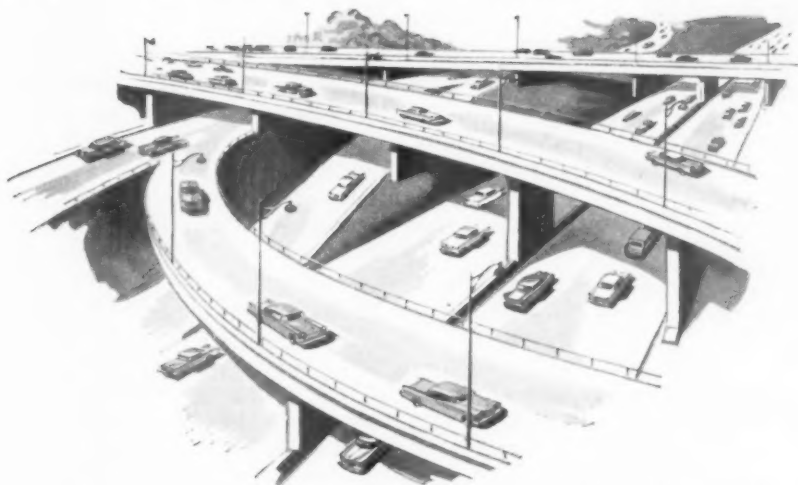
Grinding Mills



Vibrating Screens



Dryers, Coolers



Only from Allis-Chalmers

**Processing machinery and matched electrical equipment
for top efficiency in cement making**

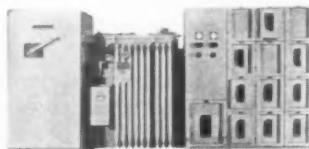
More than 50% of domestic cement is produced with A-C kilns, crushers, mills and screens. Allis-Chalmers is also one of the largest manufacturers of electric power equipment. No other company has this combination of equipment, or the vast experience in coordinating all this equipment for the ultimate in efficient operations.

Help for You and your Consultants. Before equipment recommendations are made, requirements and variables are studied carefully. An Allis-Chalmers team of research, design, manufacturing and application specialists from various processing and electrical equipment departments look into every phase of your operation. All technical conclusions are correlated in one department specializing in cement industry application. Finally, equipment is matched to meet all the requirements for top-efficiency operation. Then Allis-Chalmers assumes sole responsibility for *maintaining* efficiency.

Ask your A-C man to arrange a meeting with an A-C cement team. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



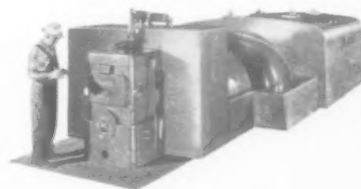
Motors



Unit Substations



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A-5770

How to get more output from your rotary drill

By PAUL C. ZIEMKE

D

rilling

a hole in the ground is still an art no matter which drilling method you employ. For instance, the economical operation of a percussion or rotary drill rig is directly dependent upon the know-how, training, ability and experience of the machine crew.

Where these factors are equal, economic factors and technical conditions, which vary from area to area, determine which method of drilling is best for any particular drilling program.

To penetrate the underground, all drilling machines produce or utilize energy. The lowest cost energy employed in drilling is mechanical. It is produced by the percussion machine lifting a mass of steel with bit attached at the end of a wire line and dropping it by gravity. Lifting and dropping of the percussion drill string at an average rate of sixty strokes per minute develops the mechanical energy that breaks up the rock formation and bores the hole.

The percussion rig is the best method for drilling those underground formations where simple, mechanical energy can be applied effectively. Its limitations arise from the fact that there are formations, sizes and depths of holes in which mechanical energy cannot be applied effectively. In such cases one or both of the rotary methods, despite the higher initial costs of the energy employed, will be more economical.

Two major advances have been achieved in rotary drilling. Reverse-circulating rotary drilling eliminates the need for heavy drilling mud sometimes used in conventional rotary drilling to seal off water-bearing sand. This method also tends to overcome the disadvantages of the slow casing drilling method which often requires weeks to complete a shallow hole.

In reverse circulating rigs power is supplied by two units, one for the pump and the other for the rotary motion and hoist. Pump and rotary speeds can be varied instantly to suit drilling conditions. A four-speed transmission on the rotary gives further speed variation.

The reverse circulation principle allows clear water for circulation to flow into the annular space between the drill pipe and the walls of the hole. When an immediate artificial head is maintained at 6 ft. above the standing water level there is no danger of caving, even in the worst stratified ground.

If accurate sampling is desired, there is no contamination from the upper strata; the cuttings are drawn rapidly up the drill pipe and deposited in the pit. A disadvantage is the need for a large supply of water for drilling at a low cost.

The rig is completely successful in varying ground where cave-ins once plagued the percussion driller. Reverse circulation rotaries drill hard formations quickly since there are no lost-time intervals in hoisting and dropping the heavy tool.

The second rotary advance is the use of compressed air in place of fluid in direct rotary drilling of blast holes. An air drill equipped

Please turn to page 98

See How Much This User Saved on a Typical Operation:



If loaded with all dynamite, cost would have been:

4210#	Dynamite (Main & deck charge)	\$829.33
1600'	Primacord	\$ 50.32
20	M.S. Connectors	\$ 10.51
Total		\$890.16

Actual cost with Spencer Prilled Ammonium Nitrate:

1002#	Dynamite (Primer & deck charge)	\$214.88
3290#	Ammonium Nitrate	\$119.09
40 gals.	#2 Diesel fuel	\$ 5.20
1600'	Primacord	\$ 50.32
20	M.S. Connectors	\$ 10.51
Total		\$400.00

SAVINGS ON 21 HOLES — 55% or \$490.16

Compare these actual costs for a typical 21-hole blasting operation, as reported by a midwestern cement company to Spencer Chemical Company, makers of

Spencer Prilled Ammonium Nitrate. Present delivered cost of Spencer Prilled Ammonium Nitrate is about 20% that of the high velocity dynamites.

How This User Saved 55% On The Cost of Blasting 21 Holes

Use of Spencer Prilled Ammonium Nitrate for Blasting
Cuts Charges on Materials, Shipping, Storage

"We saved 55% on this typical operation, using Spencer Prilled Ammonium Nitrate in place of conventional rock blasting mixtures!" That's the report of the general manager of a midwestern cement company.

It's safer and more convenient to use Spencer Prilled Ammonium Nitrate, too. That's because prilled ammonium nitrate is *non-explosive before mixed*, and can therefore be shipped or stored with other inert packaged goods.

Spencer's intensive tests using prilled ammonium nitrate include

primary open-cut blasting for coal, iron, and rock. In fact, Spencer Chemical Company is prepared to offer you the latest and most complete available data about almost every open-cut blasting situation in this hemisphere.

It costs you nothing to get the full benefits of Spencer's accumulated knowledge and experience in this field. Find out for yourself about this cost-cutting new blasting process. Spencer's special bulletin, "Cut Blasting Costs with Spencer Prilled Ammonium Nitrate," and the most expert technical advice in the country are yours for the asking. Mail the coupon—today!



MAIL THIS COUPON:

Spencer Chemical Company
Sales Supervisor,
Industrial Ammonium Nitrate
412 Dwight Building
Kansas City 5, Missouri

- ☐ Please send me free Spencer bulletin, "Cut Your Blasting Costs with Spencer Prilled Ammonium Nitrate."
- ☐ Please have a Spencer Technical Service Representative call—without cost or obligation to me.

Name _____

Company _____

Address _____

Post Office _____ State _____



A rotary rig at work

Rotary drilling

continued from page 96

with a 667 cfm. air compressor is capable of drilling up to 7 $\frac{1}{4}$ in. holes with a single compressor. A rig built with two compressors or one large compressor can drill blast holes up to 9 in. diam. This machine may also be furnished with a mud pump for mud drilling.

In quarry and other blast hole drilling, where water is hard to handle or difficult to obtain, and especially in those formations where cavities that cause loss of circulation are encountered near the surface, air drilling has proved practical as it does not depend on an unbroken system of circulation.

Like the reverse circulation principle, the direct air rotary is limited in depth and hole size, as the volume and pressure of air required increases with depth and diameter of hole.

When the air-rotary drill is used in hard rock formations, a 15-ft. pull down chain feed mechan-

ism is necessary. A variable speed hydraulic coupling provides any desired pulldown speed and pressure up to 15 tons. The jaw clutch arrangement permits gravity feed drilling. Alloy steel drill collars and connections in 15-ft. lengths are used for hard rock drilling in shallow depths, where the full force of the 30,000 pound pulldown is used.

The combination machine, which has both a mud pump and an air compressor, is most versatile since it can cope with almost any condition that may arise. The air-rotary makes all the hole required for the blaster while the mud feature permits going down deep for water-well work. Since it is equipped with a large, retractable rotary table, the rig works particularly well where large casings must be set. An extra large pump overcomes the handicap encountered in drilling wells down to 2,000 ft.

The theory back of rotary rock-bit cutting action is simple. Rotary rock drilling is the process of cutting one substance (rock) with a second substance (steel) by a turning action with uniform thrust. The cutting action may be defined as the breaking off of rock particles by the cutting edge of the bit. With this action, the bond holding the material aggregates together is broken. With homogeneous rock the chips are sheared off in conchoidal fracture.

The drillability of rock (the measure of the ease with which it may be cut), has a direct influence on the cost of a quarrying operation requiring blast holes. But little is known regarding the relationship between the physical properties of a given rock and its drillability. While several methods are being used today for determining an index of drillability for rock, there is no standardized or accepted test.

Thrust, torque and the resultant shearing forces produced in rock are involved in the cutting action of rotary bits. The general relationship between these three elements applies to all rotary bits. Fig. 1 indicates the force in rotary drilling. In theory the shear angle "a" should be the same as that formed in a compression test block.

The most significant force is thrust. Though in theory a straight-line relationship should exist between thrust and the speed of penetration, this is not borne out in practice owing to bit wear and friction between the drill rod and the walls of the bore.

Penetration speed vs. thrust curve (Fig. 2) is plotted from a test with a typical rotary drill bit. The operating factors of this drill were: Spindle speed, 400 rpm.; flushing water, 23 gpm. at

Please turn to page 100

B.F. Goodrich



B.F. Goodrich tires give up to 50% more service, contractor reports

F. R. HEWETT Co., general contractor of Spokane, Washington, operates 147 pieces of equipment on jobs throughout the Pacific Northwest. Here the job is the Spokane Valley Freeway. "We switched to B.F. Goodrich FLEX-RITE NYLON Rock Logger tires 3 years ago," writes Truck Supt. Richard M. Ward. "They have given us up to 50% more service than the tires we used previously—and we have been able to retread them too!" Today Hewett uses B.F. Goodrich tires 100%.

Reports like this come in from contractors all over the country. They find B.F. Goodrich off-the-road tires give

them longer, trouble-free service, thanks in part to FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blow-outs and flex breaks. Result: the FLEX-RITE NYLON cord body outwears even extra-thick B.F. Goodrich treads—can be retreaded over and over.

Follow the lead of contractors like Hewett, who reports B.F. Goodrich tires give "very low cost per hour." See your B.F. Goodrich dealer today. He's listed under Tires in the Yellow Pages of your phone book. And ask about the new Rock Service Tubeless or conventional

tire that prevents unnecessary tire failures! B.F. Goodrich Tire Co., A Division of The B.F. Goodrich Co., Akron 18, Ohio.

Specify B.F. Goodrich Tubeless or tube-type tires when ordering new equipment



B.F. Goodrich truck tires

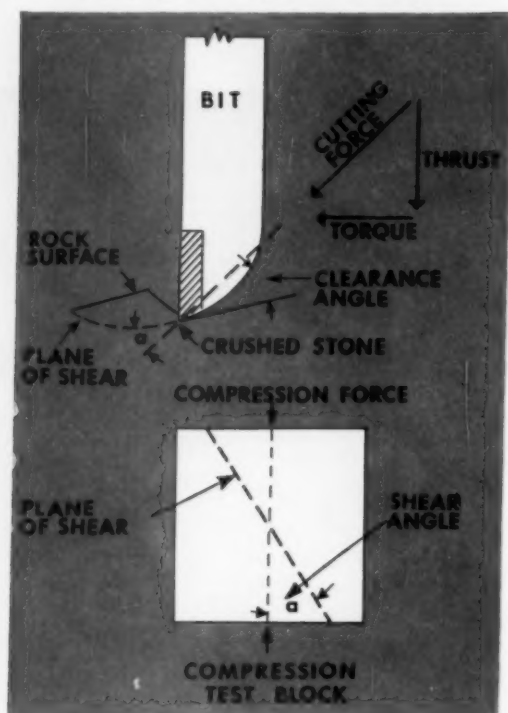
ROCK PRODUCTS, August, 1958

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FIG. 1. Rotary drilling forces and shear angle



Rotary drilling

continued from page 98

100 psi.; and three different thrust values of 1,000, 2,500 and 3,400 lb.

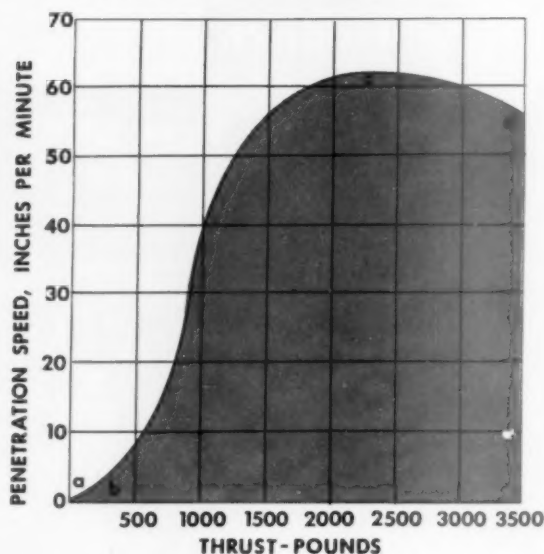
The gradient of the curve is divided into three general parts:

Part A-B illustrates the grinding stage. This occurs with inadequate thrust. The cutting edge of the bit bounces against the rock face instead of biting in. Consequently, the bit grinds instead of cuts. This is reflected in slow rate of drilling and a high rate of bit wear.

Part B-C of the curve illustrates the cutting stage; the thrust value at which this occurs varies with the bit design, operating factors, and the grade of stone. With adequate thrust the depth of cut is increased. The tip of the cutting edge crushes the rock, and the cutting forces penetrate the crushed zone, shearing off a characteristic chip or flake. Maximum efficiency is reached at this stage.

Part C-D of the curve in Fig. 2 illustrates the binding or plugging stage, which takes place with some bit designs under high thrust. In this test the penetration speed fell off rapidly when the thrust exceeded 2,500 lb. With this thrust value the chips are not removed from the rock face fast enough to prevent binding at the cutting edges.

FIG. 2. Penetration speed varies with thrust



Comminution of the cuttings occurs; the bit tends to bind and the water port to become plugged. This lack of sufficient cuttings removal causes a decrease in the penetration speed and an increase in power consumption. It is apparent that for efficient drilling, enough flushing water must be supplied at high pressure and that the bit design must permit a free-flushing flow of the cuttings.

The rock chips form like the discontinuous shavings from a lathe. Crushing takes place at the start of the cycle, and the cutting force is transmitted through a shear plane extending to the edge of the rock face. As the line of shear moves to the surface of the rock a chip is formed when the shear strength of the rock has been exceeded.

Size tests of the drill cuttings afford an indirect method of measuring bit drilling efficiency. With more effective cutting action, larger chips are formed. By increasing size of the chips, a corresponding decrease in the amount of new surface is produced.

If the fairly reasonable assumption is made that drilling is a form of crushing, Rittingers' proposal that "the energy required for crushing is directly proportional to the increase of the surface exposed" is applicable.

The width of a chip formed by a rotary bit is greatest near the center of the bit; it decreases toward the gauge or outer edge of the drill bit. This can be shown by tracing the movements of imaginary points A and B (A nearer the center) on the cutting edge of the bit. As the bit penetrates the rock, each of these points describes a helical path. Since each point penetrates an equal distance per revolution, the angle of the smaller

Please turn to page 120

How Wisconsin pit strips overburden fast and at low cost



The Wilson and Shieler Limestone Pit at Beloit, Wisconsin, produces crushed stone, which is sold as sub-base or top dressing for roads. As their mining activity expands, so too, the job of overburden removal becomes larger and costlier. But owners of this Wisconsin pit find that there is a sure, modern way to handle the job fast and at low cost. They use a speedy, rubber-tired LeTourneau-Westinghouse D Tournapull® 9-yd. scraper. Here's how this pivot-steer dirtmover performs:

Loads 7½ yds. in 44 sec.

Removing sand and clay from limestone formation, scraper is push-loaded with average of 7½ yds. in 44 sec. — according to co-owner Carroll Wilson. Load, haul, spread and return cycles of 2200' are completed in 3 min. 42 sec. That's 13 trips per 50-min. hour. Working 10 hours a day, this single D Tournapull

pull strips an average of 975 yds. of overburden daily.

Earns extra profits

When stripping work is completed Wilson and Shieler don't let their Tournapull scraper sit idle. They use it for miscellaneous dirtmoving assignments around the pit... or they send this mobile scraper out to handle nearby land-leveling contract jobs for extra profit.

You be the judge

Let us arrange to demonstrate the D Tournapull scraper at your pit. Time its cycles, measure its performance for yourself. We're sure you'll find this 138-hp LeTourneau-Westinghouse unit a good producer on overburden work, and a worthwhile "handyman" for clean-up work, haul-road construction, drainage improvement, and other self-loading jobs. Call us for full details.

DP-1797-QMJ-1

Working along edge of deep pit, 138-hp D Tournapull loads an average of 7½ yds. of clay and sand in 44 seconds. Fast-acting electric controls, big air brakes, and high traction tires assure operator and machine safety.



Reduce equipment inventory

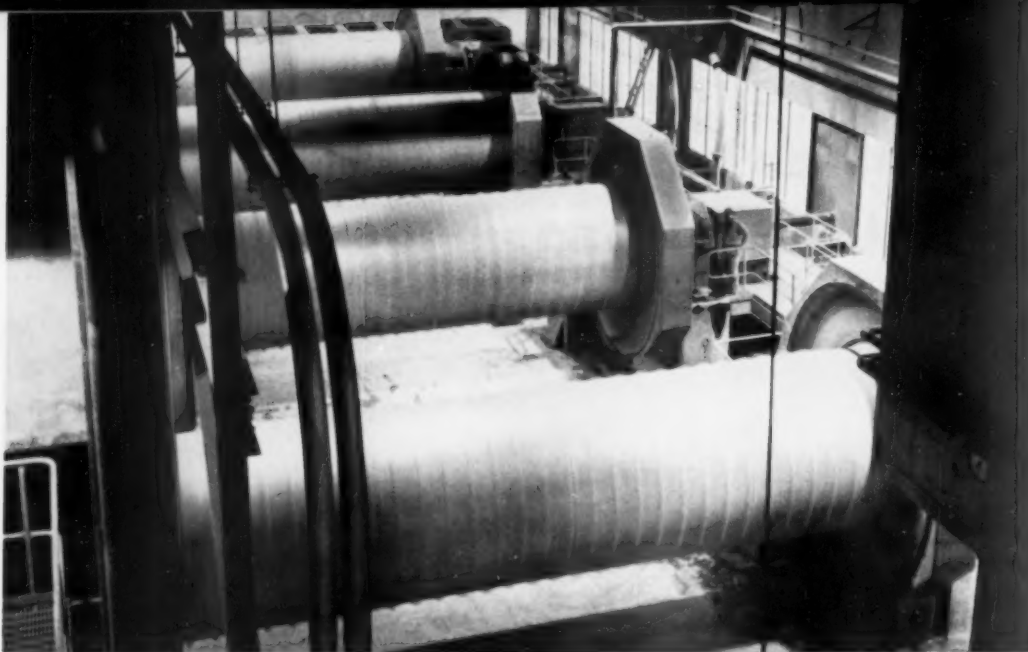
For less than ¼ of the cost of the Tournapull with scraper, you can get an 11-ton Rear-Dump trail-unit to interchange with original scraper. You'll then have a two-way high-production tool to help you reduce pit hauling costs and equipment inventory. Other trail-units to increase prime-mover usefulness also available.



LETOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit



Wet grinding—past, present, future

A look at yesterday's . . . and tomorrow's . . . methods

By C. A. ROWLAND*

SATISFACTORY KILN FEED is composed of materials containing a minimum amount of oversize particles, without an excess of extreme fines. Meeting these size specifications results in a uniformly burned cement clinker and reduces dust loss in the kiln.

The methods of controlling the particle size of the raw material from the grinding circuit have varied at different times—from simple screens to complex circuits of auxiliary equipment. Each has been an innovation of a basic circuit and each has met the requirements of the kiln operator with varying degrees of success.

Here is a discussion of wet grinding—past, present and future—describing the advantages and limitations of eight separate, but related means of seeking the ideal result.

The open-circuit Compeb mill (compartment mill) was the first modern circuit used. It uses large balls in the first compartment and smaller size balls in the following compartments. Its principal advantage is simplicity: only one mill is used,

*Processing Machinery Dept., Allis-Chalmers Mfg. Co.

and that can be operated in open circuit without the use of classifiers, screens or materials handling equipment.

The principal disadvantage of this mill is the production of spitzers or tramp oversize. Fig. 1 shows how feed passes into the first compartment and progresses through the mill. The slots in the division head at the first compartment are normally from $\frac{3}{8}$ to $\frac{5}{8}$ in. wide. This permits some material of these sizes to travel through to the second. Since the balls in the second and third compartments are normally of $1\frac{1}{2}$ in., 1 in. or smaller, they are actually too small to handle tramp oversize. As a result, this oversize material will pass through the mill and be discharged practically unground.

Tramp oversize is objectionable in the operation of a rotary kiln, since it does not burn uniformly. Open-circuit compartment mills are noted for the amount of plus 50 mesh oversize material they produce.

To avoid this oversize, some type of control device is needed in the mill circuit. There are two

Please turn to page 104



No hydraulics
to break, leak
or freeze-up!

No small front
steer-wheels
to align!

No tie-rods
to bend!

No springs
to break!

No frame
to warp!

No long drive-shaft
to maintain!

Here is a way to cut hauler maintenance costs

If your pit's profits are shrinking — due to high hauler maintenance costs and downtime — here is a hauler you should investigate. It's the LeTourneau-Westinghouse Tournapull® Rear-Dump. This modern machine eliminates most maintenance problems of conventional haulers. Here's why:

Simplified construction

Tournapull Rear-Dumps are constructed radically different (and much simpler) than are conventional heavy-duty haulers. In place of a foundation frame and body sub-frame, machine hitches rear and front wheels through a horizontal yoke extending back from the kingpin, and pivoted to body itself just above and ahead of rear wheels. Body is

simpler, much stronger... has no frame and sub-frame to get out of line.

Look at the photo above... note the absence of springs, spring hangars, and tie rods. Low-pressure tires adequately absorb the shocks of rough haul-road travel and shovel loading. Eliminated are spring maintenance, replacement time, and cost of spring parts.

Front-wheel drive and kingpin-type power steer helps simplify Tournapull construction, too. No longer must power be carried back to the rear through a drive-shaft. Bearing and lubricating problems of a long drive-shaft are eliminated. No longer is steering handled by small front wheels subject to "bulldozing" and misalignment. There are no

tie rods, no hinged steering connections to become twisted or bent.

Nor do you have the troubles of hydraulic hoists or jolts of gravity dumping with these Rear-Dumps. Dump is by an electric winch, that lifts the body up on twin cables. Operation is under complete control at all times — with positive power for dump and return controlled by an electric switch on the dash. There are no oil seals, hydraulic pumps... no high-pressure lines and jacks to keep tight... no freezing up in cold weather as with hydraulics. There are no shock loads as in gravity dumping. You save on regular maintenance time because there is no hoist mechanism to check... only a few accessible places to inspect and lubricate.

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R-1642-MQ-1



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Where quality is a habit

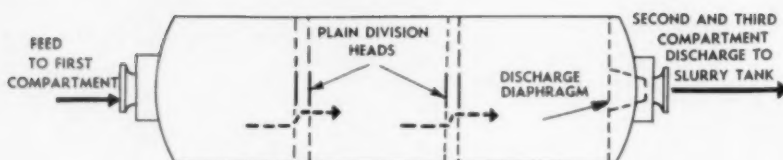


FIG. 1. COMPARTMENT MILL

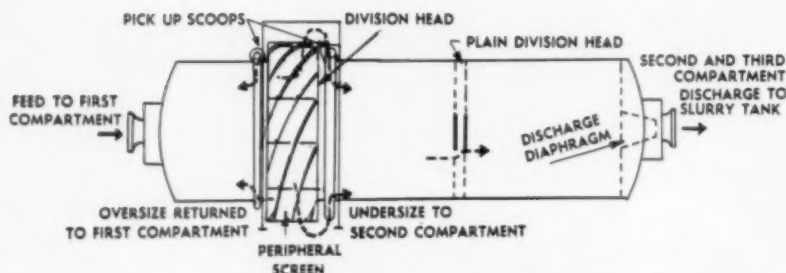


FIG. 2. COMPEB COMPARTMENT MILL WITH PERIPHERAL SCREEN

Wet grinding methods

continued from page 102

basic types of arrangements developed for this purpose: The first is a closed circuit for the entire ball or Compeb mill, using either a screen or a classifier. The second is to control the feed size going into the last grinding compartment.

The compartment mill with peripheral screen, introduced in the 1920's, was theoretically sound. The first compartment of a Compeb mill was close-circuited by a screen built around its periphery. The material which passed through the first grinding stage was discharged peripherally onto the screen, where the oversize was picked up by scoops and fed back into the first compartment. The screen undersize was also scooped up and passed to the second compartment. The balance of the mill operated in open circuit, Fig. 2.

The peripheral discharge compartment mill would have succeeded except for mechanical difficulties. The first difficulty was in the use of a revolving screen. Because the screen rotated at the same rather slow speed as the mill, the effective screening area was quite small. If a fine separation (8 to 14 mesh) was attempted, lack of screening area caused a considerable amount of fine material to be returned to the first compartment. In

order to have the correct clear opening for the screening area available, it was necessary to make the opening so coarse that its closed circuit effect was eliminated.

The mill was made both as one diameter and two diameter mills. A problem common to both styles was excessive wear on the pick-up scoops. In addition, considerable difficulties arose in conjunction with the two diameter shells. The problems involved in this design limited its success, and most operators today have removed the peripheral screen feature from the mills still being used.

Ball-mill tube-mill circuit. The outgrowth of circuit No. 2 was development of the ball-mill tube-mill circuit shown in Fig. 3: a separate ball mill operated in closed circuit with a vibrating screen. The screen undersize then went to a Ballpeb (tube mill) which operated in an open circuit. This was quite popular in the days when the ring roller mill was used as a preliminary grinding unit in the finish circuit. It allowed the tube mills to be duplicates, which is quite an advantage to cement plants in stocking spare parts.

While this circuit is sound and still in use today, the two individual mills create a more expensive grinding installation. Foundations are required for two mills, two motors, two gears and two pinions. In addition, there are the usual complications of running two mills and handling the discharge from one mill to the other.

Please turn to page 106

Makes quick work of haul-road maintenance

You know from experience that using the *right* tool on any job completes the work faster and easier. The same holds true when maintaining your haul roads, pit floor, dump areas around crusher, and stockpiles, or waste dump. Use a heavy-duty L-W Adams' grader for these maintenance assignments. You'll find you can complete this work *faster* and *at lower cost*.

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All LeTourneau-Westinghouse 80, 115, 123, and 160 hp Adams graders have constant-mesh transmission as standard, with 8 forward and 4 reverse speeds. In addition, 3 optional creeper speeds provide extra lugging power for turning up rocky sub-surfaces and for greater grading accuracy. Choice of 15 gear ratios give you the balance of power and speed to handle every grading job... in any material... at top efficiency.

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Adams' blade mechanism is firmly mounted on a heavy-duty circle for chatter-free operation. Strong T-shaped drawbar gives L-W grader firm circle support for accurate blading in any material.

Blade positioning is fast... it swings maximum arc from deep ditch-cut to high bank-cut in less than a minute. Moldboard turns 360°—clockwise or counter clockwise—provides quick change from any forward work position, to desired angle for reverse ditching and grading.

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All gears operate on anti-friction bearings—for less wear, easier operation. Automatic braking on



Powerful L-W Adams 660—at large open-pit mine in Arizona—patrols busy haul roads 24 hr a day, 6 days a week. Grader goes wherever needed (at speeds to 26 mph) to fill ruts, level washboard, clear debris dropped by overloaded haulers and improve drainage.

transmission, when hydraulic brakes are applied to wheels, gives safer operation and less maintenance. And because L-W power-control clutches shift on ball bearings, you have easier, smoother, safer controls... assuring accuracy, speed, and performance with minimum upkeep.

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Between regular assignments, your LeTourneau-Westinghouse grader need not sit idle. With available attachments, such as Jebco Elegrader,

bulldozer blade, scarifier, snow plow and wing, you can keep this grader busy on your property the year round. Also, grader's high travel speeds (to 26 mph) permit the profitable handling of jobs for adjoining pits. There are 7 Adams models—60 to 190 hp. Your choice of GM or Cummins engines on 6 larger models. 190 and 135-hp POWER-Flow® models have torque-converter drive... will do more work faster than any other graders on the market. Call or write for a demonstration today!

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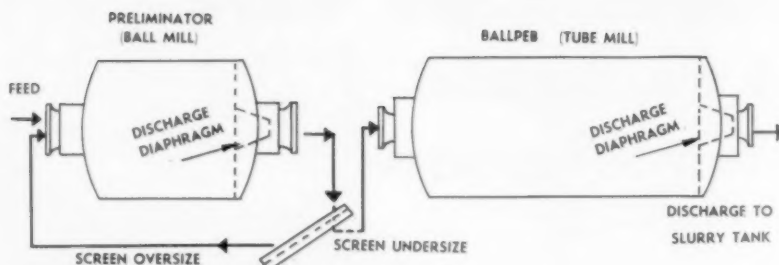


FIG. 3. BALL-MILL TUBE-MILL

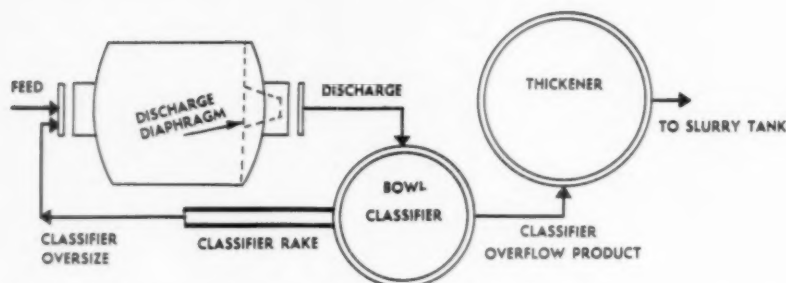


FIG. 4. BALL MILL CLOSED CIRCUIT

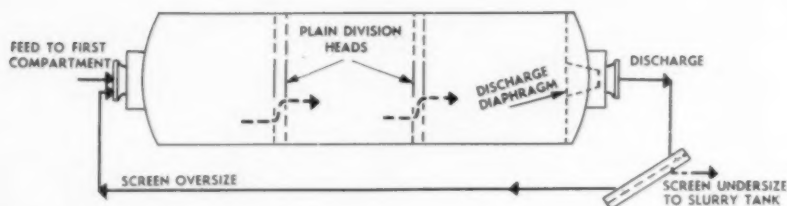


FIG. 5. COMPEB MILL AND SCREEN

Wet grinding methods

continued from page 104

The basic compartment mill (Fig. 1) and other open-circuit mills often show very high power consumption. Theoretically, open-circuit requires 20 to 30 percent more power than closed-circuit grinding. Practically, cement plants show that closed-circuit grinding has resulted in power ratings as high as 80 to 90 percent, with the average about 50 percent. This indicates that in order to control the amount of tramp oversize, the open-circuit mills have always been held back. Another result of this reduced feed rate, mills of this type frequently produce a large amount of extreme fines, Fig. 4.

Ball mill in closed circuit. The natural step from the open-circuit Compeb mill was to consider a ball mill in closed circuit with a bowl classifier, the principle used in the mining industry to prepare feed for the concentrators. This scheme permitted an increased feed rate of cement raw materials and considerably reduced the amount of power required for grinding—in some instances, by as much as 40 percent.

Then a new difficulty arose! To be comparable to the open-circuit Compeb mill, slurry as fed to the kiln should not contain more than from 35 to 40 percent moisture. Greater moisture in the kiln feed requires more heat to drive off the additional water. The overflow from the classifier contained 75 to 85 percent moisture. The need for thickening and possibly filtering was evident. But cement raw materials often contain clay or materials of similar nature which are very difficult to thicken and as a

Please turn to page 108



LIMA Type 803 Shovel, equipped with 30-ft. boom and 2½-cu. yd. bucket, loading truck at J & K Stone Co., Inc., quarry, Muncie, Ind.

J & K Stone Co., Inc., finds LIMA dependability a big factor in maintaining production

J & K Stone Co., Inc., Muncie, Ind., is a leading supplier of specification materials to all types of road-building contractors in that area. Main plant capacity is now approximately 1800 tons per day with a second plant producing about 1000 tons per day. It is expected that this plant will soon exceed the capacity of the main plant. Two rugged LIMAS handle the digging and loading jobs.

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prompted us to buy another LIMA. The older machine was retained for our secondary operation.

"In my opinion, LIMAS are quality machines, built for long profitable operation with many plus features which have added to the continued operation of one plant.

"Another big factor that has sold me on LIMA is their exceptional factory service. This is extremely important, because our capacity is in direct ratio to the capacity of our LIMAS."

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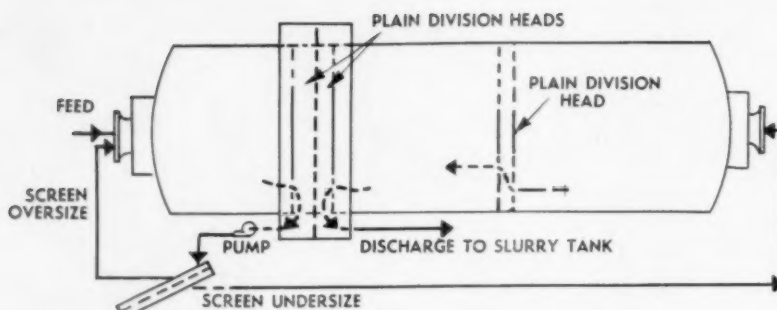


FIG. 6. PERIPHERAL DISCHARGE COMPEB WITH VIBRATING SCREEN

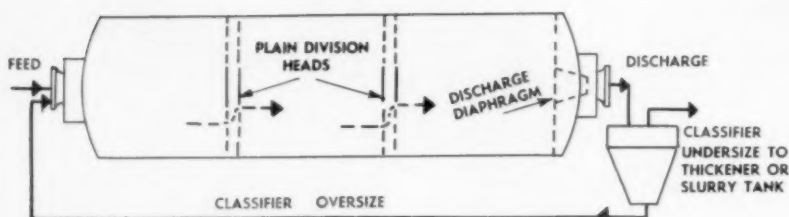


FIG. 7. COMPARTMENT MILL AND CONE CLASSIFIER

Wet grinding methods

continued from page 106

result require tremendous thickener area. In some instances, it has even been necessary to use additives to assist the thickening.

Even though this circuit had the most economic power consumption per ton of raw material ground, its application was limited and was practical only when the raw materials could be readily thickened.

The present concept of the basic compartment mill frequently takes the form shown in Fig. 5. In this method of wet grinding the mill discharge passes onto a vibrating screen, with oversize returned to the feed end and the screen undersize going to a slurry tank. This arrangement should prevent spitzers and tramp oversize.

Initially, however, these screens were often furnished with 10 or 14-mesh screening surfaces, still permitting some objectionable oversize in the kiln feed. The result was that these mills often operated with circulating loads as low as 30 to 35 percent and the screen had a scalping or protective function rather than being a true closed circuiting screen.

With unsatisfactory results from a coarse screen circuit, interest was stimulated in other types of classification. Several circuits using a cone classifier were disappointing, so once again a screen circuit was attempted, this time with finer decks.

A few plants have used compartment mills in closed circuit with 50-mesh screens. There should be a high circulating load to take advantage of this closed circuit, for a large screen area is required for the fine particles, an application which is rather special and usually expensive. To keep the screening area to an economical limit, the circulating load has to be reduced to 30 to 40 percent by holding back the feed rate.

It was discovered that, when returning the plus 50-mesh material to the feed end of the mill, much of the circulation load is actually fine sizes. These are not ground until they get into the second compartment, where the ball sizes are proper for this finer feed. Yet, because there is some material up to $\frac{1}{4}$ in. or coarser coming off the screen, it is necessary to return all the screen oversize to the first compartment of the mill.

Compeb mill with vibrating screen. It was pointed out in the discussion of the Compeb mill with peripheral screen that the principle involved in this arrangement is a sound one; it controls the feed of the material going to the second compart-

Please turn to page 110



Aggregate Loading. Model 543 loads continuously at low cost. 15 m.p.h. travel speed. Hydraulically controlled swivel conveyor trims load. Power hydraulic boom hoist. Dual transmission. Automatic overload release. Capacity to 3 cu. yd. per min. Easily converted for coal, snow or leaves.



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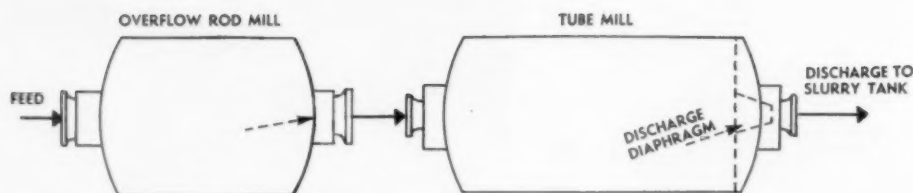


FIG. 8. ROD-MILL TUBE-MILL COMBINATION

Wet grinding methods

continued from page 108

ment, and still allows the second and third compartments of the mill to operate in open circuit, producing a satisfactory kiln feed. Figure 6 illustrates adaptation of the same circuit, except that instead of using a peripheral screen, a vibrating screen is included.

With this circuit the screen undersize is carried to the far end of the mill and uses the same peripheral discharge housing as does the first compartment. This housing is divided so that there can be no mixing of the discharge from the first compartment and that from the second and third compartments. The advantage of controlled feed size to the last compartments of the mill is assured. The screen can be 10, 14 or even 20 mesh.

The vibrating screen permits the cement plant operator to push the peripheral discharge Compeb to its ultimate capacity for partial open circuit grinding, thereby preventing over-grinding. At the same time, the first compartment is in closed circuit and tramp oversize cannot get into the balance of the compartments. This arrangement has an advantage over the Compeb mill-screen circuit, Fig. 5, when a 10 or 14-mesh screen is used; the screen undersize is ground further in the last compartments of the mill, so there are few or no particles in the kiln feed near the screen separating size.

This arrangement incorporates all the advantages of the open circuit feature. Pulp density can be kept at a minimum consistent with good kiln feed and at the same time, higher capacity of the mill is allowed by controlling the amount of material fed to the last compartments.

The power consumption per ton of material in this type of mill is considerably less than in an open circuit Compeb mill for two reasons. First, the first compartment of the mill is in closed circuit, making power consumption consistent with a

closed circuit ball mill. The balance of the mill is in open circuit. However, with controlled feed size there is not the loss in power due to holding back the feed rate to these compartments.

A second factor in reduced power consumption is that the peripheral discharge vibrating screen circuit controls the feed to the second and third compartments consistent with the ball size. Therefore, the peripheral discharge compartment mill should not take more than 20 to 30 percent more power than the basic open-circuit compartment mill.

An additional advantage of this circuit is that it utilizes the standard, more economical, screens and screen cloths. While the product from this type of mill should be fairly consistent with the product from the Compeb mill screen circuit discussed previously (Fig. 5) the screening area required for a 10 or 14-mesh separation is not nearly as great as for the 50 mesh separation.

Compeb mills and cone classifiers. A few years ago an effort was made to use Compeb mills in closed circuit with cyclone and cone classifiers. These classifiers worked on a centrifugal force principle rather than on settling area as the big bowl and rake classifiers do. It was felt that these classifiers had a fair chance of working. The idea was to obtain a closed circuit without the high dilution required in classifiers using the settling area principle. A number of experiments were run, and several plants installed cone classifiers.

The results did not prove satisfactory. For cone classifiers to be efficient, the feed to the classifiers had to have 50 to 60 percent moisture, which meant more water in the classifier overflow. This was too diluted for kiln feed and led back to the disadvantages of thickening and filtering in the ball mill closed circuit.

Today little consideration is given to cone classifiers for closed circuiting Compeb mills. With the failure of most cone classifiers to operate at 35 percent moisture, efforts returned to developing vibrating screens with 40 or 50-mesh separations.

Please turn to page 119

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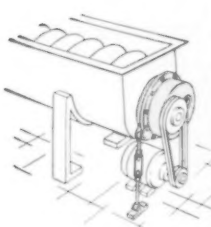
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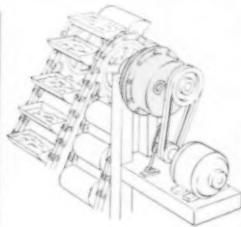
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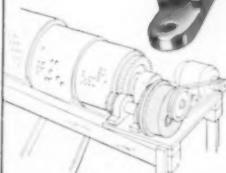
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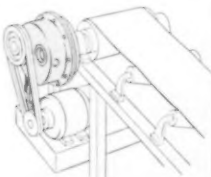
SCREW CONVEYOR



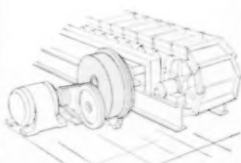
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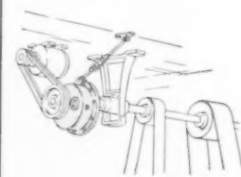
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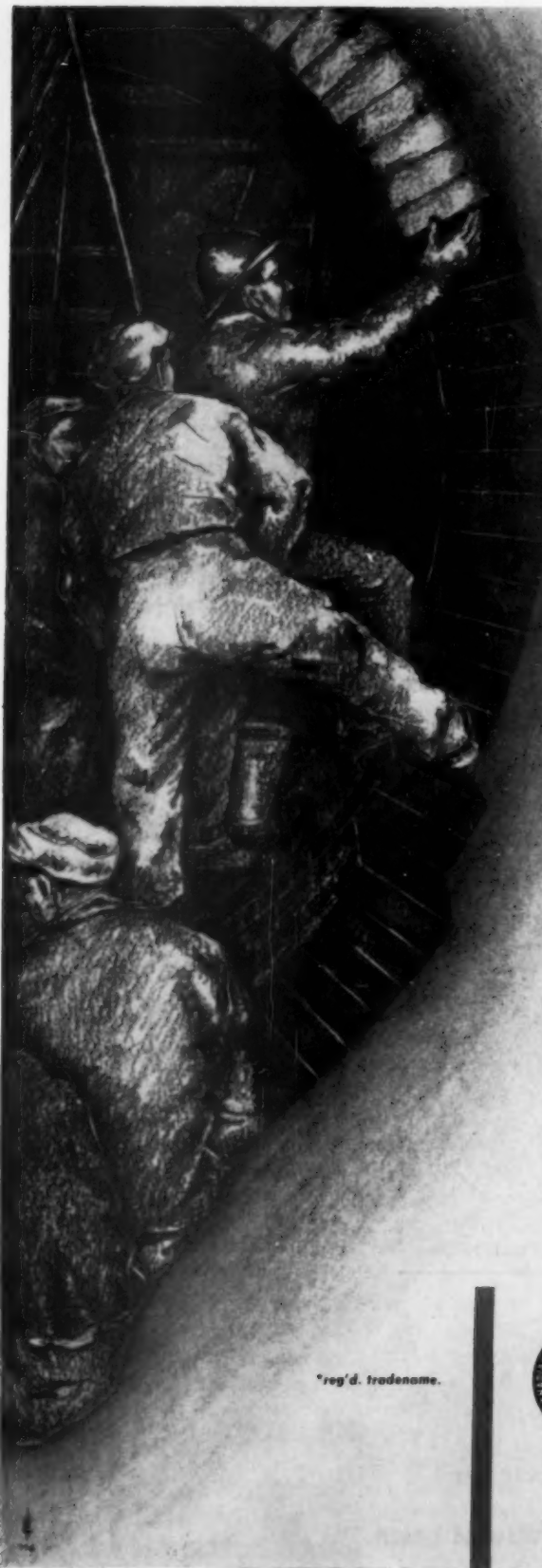
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William J. Cannon, The Nugent Sand Co., takes the helm of NISA for 1958

Specialized progress reports heard at NISA annual meeting



Emery M. Durstine (right) is awarded a plaque for his faithful service to NISA as president by Sterling N. Farmer

Emphasis placed on taxes, labor, public relations, transportation

PROGRESS REPORTS BY STREAMLINED COMMITTEES played an important role at the National Industrial Sand Association's 23rd annual meeting, held May 14-16 at Hot Springs, Va.

Started as an experiment about a year and a half ago, the specialized committees work year-round in more than a half-dozen major problem areas. Effectiveness of the method stood out at Hot Springs, as members heard up-to-the-minute reports on important industry topics such as taxes, public relations, specifications, traffic and fineness and grading.

These reports by committee chairmen were combined with regular business sessions during the three-day meeting. Members also saw a sound-color film on zoning restrictions and land rehabilitation, heard Prof. Ray B. Crepps of Purdue University predict a bright future in construction for glass (and with it, industrial sand). A highlight of the meeting was a "Washington Report" by Vincent P. Ahearn, executive secretary of NISA.

Newly elected president of the association is

William J. Cannon of the Nugent Sand Co., Muskegon, Mich. Other officers elected for the coming year include Arthur B. Schlesinger, New Jersey Pulverizing Co., New York City, vice president, and James C. Lockwood, Ottawa Silica Co., Ottawa, Ill., treasurer. Four new members of the board were elected, one replacing Mr. Lockwood, who took over the treasurer's job. A. Y. Gregory, Whitehead Bros. Co., was voted an honorary membership on the board of directors.

First day of the meeting was set aside for committee meetings. A novel feature of these meetings was that they were open to the entire membership. Although members got a full report on committee actions in a later session, the preliminary committee huddles gave noncommitteemen a chance to gain background information of the individual-experience type in any field that interested them.

Confidence in the future of NISA and the industry was expressed by the outgoing president, Emery M. Durstine. Through the work of the committees and the Washington staff, the association

Please turn to following page



New officers and board members (left to right): William J. Cannon, president; Arthur F. Harrison, new board

member; Arthur B. Schlesinger, vice president; Karl Geng, board member; James C. Lockwood, treasurer

NISA meeting

continued from page 113

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Arthur B. Schlesinger, Vice President
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A. Y. Gregory*
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C. Franklin Wolf (1961)
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*Honorary Member

has made several forward steps in the past couple of years. Membership and budgets have grown to record proportions. Negotiations with railroads and various commissions in an effort to keep rail rates from rising beyond reason have been successful; relations with the Treasury Department and Congress have been good.

NISA has just completed a successful joint project with the American Foundrymen's Society on specifications, and work is now underway in cooperation with the Navy and the American Steel Founders Society to set up satisfactory specifications for sand.

A new retirement program, available to NISA members through Donald Shepherd and Co., was explained by Donald Shepherd. The program is set up through a trust designed so that any member can select a program tailored to the wishes and corporate structure of his company. Either a profit-sharing or pension-type program is available. According to Mr. Shepherd, advantages of the plan are: (1) Economy of operation; (2) the fact that it can be used for salaried and union employees; (3) the excellent service available through eight offices strategically located throughout the country.

Taxes are a perennial problem. At the time of the meeting there was still much activity in Congress with proposed legislation on corporate tax rates, percentage depletion and depreciation taxes. Court decisions already made give cause for op-

Please turn to page 116

FEEDING FLOATING PLANT



Dragline Speeds Flow of Sand and Gravel for Virginia Firm

This Marion dragline equipped with 4½ yard bucket helps a Virginia firm produce a steady flow of sand and gravel to supply its many outlets in the Middle Atlantic area.

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In dragline service, booms are available to 100 feet, buckets to 5 cubic yards. With any front end combination, the 111-M is a real producer. The 111-M diesel with electric swing does many types of big jobs well, and offers significant operating advantages. Let your nearest Marion Distributor tell you more about this outstanding Marion and the jobs it is doing.

MACHINE	Shovel Capacity	AVAILABLE AS . . .			
		Hoe	Crawler Crane	Truck Crane	Special Crane
35-M	¾	Yes	Yes	Yes	—
43-M	1	Yes	Yes	Yes	—
362	1½	Yes	Yes	—	Yes
87-M	—	—	Yes	—	Yes
93-M	2½	Yes	Yes	—	Yes
101-M	3	—	Yes	—	—
111-M	4	—	Yes	—	—



POWER SHOVEL COMPANY

A Division of Universal Marion Corporation
Marion, Ohio

SEND ME information about **MARION** yard shovels,
..... yard hoes and ton cranes (☐ crawler
mounted ☐ truck mounted). ☐ Have a salesman call.

NAME TITLE

COMPANY

STREET

CITY ZONE STATE

NISA meeting

continued from page 114

timism, reported John T. Sapienza of Covington and Burling, counsel for NISA. All cases decided by the courts have favored the taxpayer as far as ordinary treatment processes are concerned.

Administration, however, is lagging behind, Mr. Sapienza added. There is a big backlog of cases, rulings and regulations. It is hard to determine whether this is caused by a slow hardening of governmental arteries or by growth in the volume of cases. In any event, you can expect a delay in processing if you have a case or have requested a Treasury Department ruling.

Mr. Sapienza also reported that, unless there is strong opposition, two measures dealing with the cut-off point will be passed by Congress. In the Dragon Cement case and in those affecting the clay, brick and tile industries, the courts decided that this point, for percentage depletion purposes, is the first commercially marketable mineral product. For the industrial sand industry, this would include pulverizing, bagging, drying and other operations.

But, reported Mr. Sapienza, the Treasury Department is having trouble in determining the "first commercially marketable mineral product." The tendency has been for Treasury to put this on a national basis, but the courts say it depends on a local market.

A new bill in Congress may, if passed, put a different light on the situation. The bill would allow cement companies to include operational costs only through crushing and grinding. Mr. Sapienza warned that although the Supreme Court has favored the taxpayer in percentage depletion cases, it can reverse its position at any time.

There are many bills on depreciation in the Congressional hopper, and all of them propose to give the taxpayer more depreciation. At the time of the report, Washington felt that the best way out of the recession was to help business, which in turn would up employment.

The importance of public relations is being accented by an NISA committee headed by Karl Geng. Prime function of the committee, according to Mr. Geng, is to provide a clearinghouse for the exchange of information on public relations, zoning and related subjects.

Spending a lot of money just to entertain people is not the way to get good public relations, according to Gene Mason, Clayton Silica Co., Cedar Rapids, Ia. In explaining the program carried on by his company, Mr. Mason stated that the first thing to do is to get proper employee-employer relations. Accent good housekeeping, work with local cham-

bers of commerce, keep in touch with zoning officials—these are only a few of the activities that are necessary for good public relations. But you must be active in each of these areas to gain the proper benefits, Mr. Mason said.

You have to meet zoning problems before they develop and grow, said Kenneth Tobin, Jr., associate executive secretary of NISA. Mr. Tobin spoke briefly before showing a film, "The Rumor," produced by American Aggregates Corp. Many damaging rumors arise when word first leaks out that a sand and gravel (or industrial sand) plant is to open in a locality. The sound-color film is designed to dispel rumors by presenting the facts on what a new plant will mean to the citizen and the citizen's community.

The importance of having more detailed labor information from members was again emphasized by the Advisory Committee on Labor, headed by Ralph S. Lebold of Michigan Silica Co. The work of expanding and revising NISA survey questionnaires, which began last fall, is continuing.

Fineness and grading of foundry sands is a problem that has been kept very much alive by W. D. Chadwick and his committee. One project on specifications, carried on jointly with the American Foundrymen's Society, has been completed successfully. Now the American Steel Founders Society is becoming scientific and exacting on grain distribution in industrial sand products. Mr. Chadwick and his committee have devoted many hours to this problem and have prepared tentative specifications for zircon sand, silica flour and sand. It is expected the final specifications acceptable to both sides will have been prepared by next fall.

Activity of the Traffic Committee, headed by William J. Woods, Jr., was instrumental in getting a reduction in railroad carriers' request for an industrial-sand freight-rate increase (Ex Parte 212). Carriers had asked the Interstate Commerce Commission for a "selective" increase of 10 percent with a minimum of 15 cents per net ton for industrial sand. Through action of the NISA committee and allied interests, the railroads agreed to reduce their demand to three percent with a maximum of 12 cents per net ton. This increase was approved by the ICC, to be effective Feb. 15, 1958.

Further plans of the Traffic Committee are to:

1. Suggest to carriers that they keep their bad order situation at a reasonable minimum of total ownership.
2. Cooperate with the rail research committees to explain the industry's position and to discourage future freight rate increases on industrial sand.
3. Retain Henry Wick as Traffic Counsel.

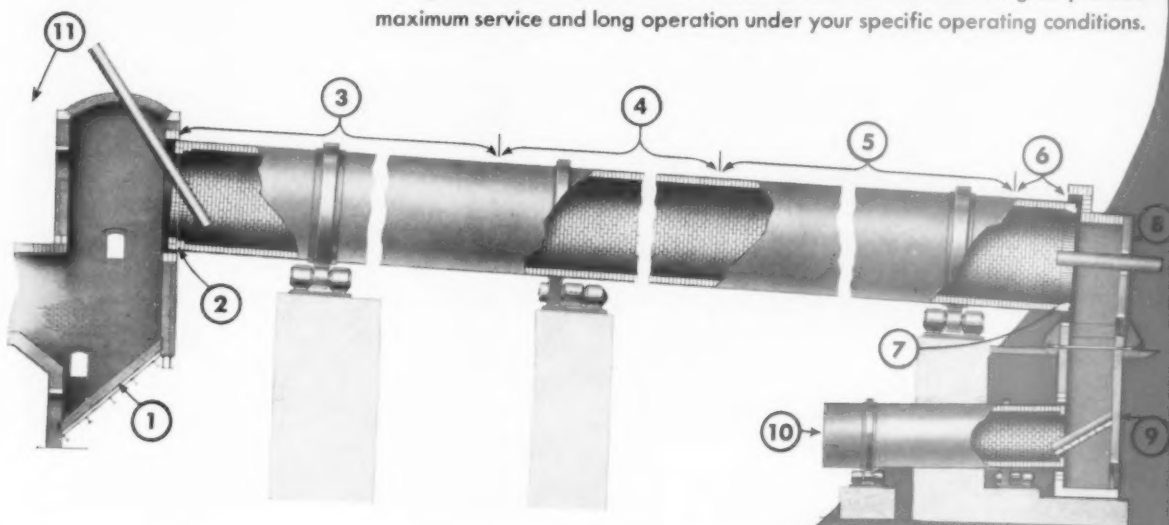
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REFRACTORY
PRODUCTS**



A. P. GREEN REFRACTORIES LESSEN "DOWN-TIME"... RESIST WEAR IN THESE 11 CEMENT KILN AREAS

These recommendations apply to the majority of cement and lime kilns. Where unusual conditions exist, your A. P. Green Representative will work with you to determine the most effective and economical lining to provide maximum service and long operation under your specific operating conditions.



	In This Section Of Your Kiln	These A. P. Green Brick Will Give Better Service	Approximate Temperatures
①	Dust Collectors	EMPIRE OR OZARK Dry Press brick for moderate duty service.	Up to 1300° F. or 705° C.
②	Feed End or Tail Ring Construction	MEX-KO or EMPIRE for mechanical strength, structural stability and uniformity.	Up to 1400° F. or 760° C.
③	Drying or Preheating Zone	EMPIRE Liners for high strength, uniformity, resistance to abrasion.	Up to 1800° F. or 980° C.
④	Intermediate Zone	A. P. Green HOT ZONE Liners to resist spalling and abrasion.	Up to 2400° F. or 1315° C.
⑤	Burning Zone	KRUZITE Liners to resist chemical attack, slagging, spalling and abrasion.	Up to 2900° F. or 1595° C.
⑥	Cooling or Soaking Zone	A. P. Green HOT ZONE Liners to resist abrasion and spalling.	Up to 2500° F. or 1370° C.
⑦	Discharge or Nose Ring Block	MEX-KO or EMPIRE for mechanical strength, dimensional uniformity and resistance to thermal spalling.	150° F. to 2200° F. or 65° to 1205° C.
⑧	Kiln Hood	MEX-KO, EMPIRE or castable construction to resist spalling.	Up to 2400° F. or 1315° C.
⑨	Clinker Chute	EMPIRE to resist abrasion and spalling.	Up to 2200° F. or 1205° C.
⑩	Cooler	EMPIRE Liners for rotary coolers to resist abrasion and spalling.	Up to 2000° F. or 1095° C.
⑪	Waste Heat Boiler (not shown above)	EMPIRE or OZARK Dry Press brick for moderate duty service.	Up to 1200° F. or 650° C.

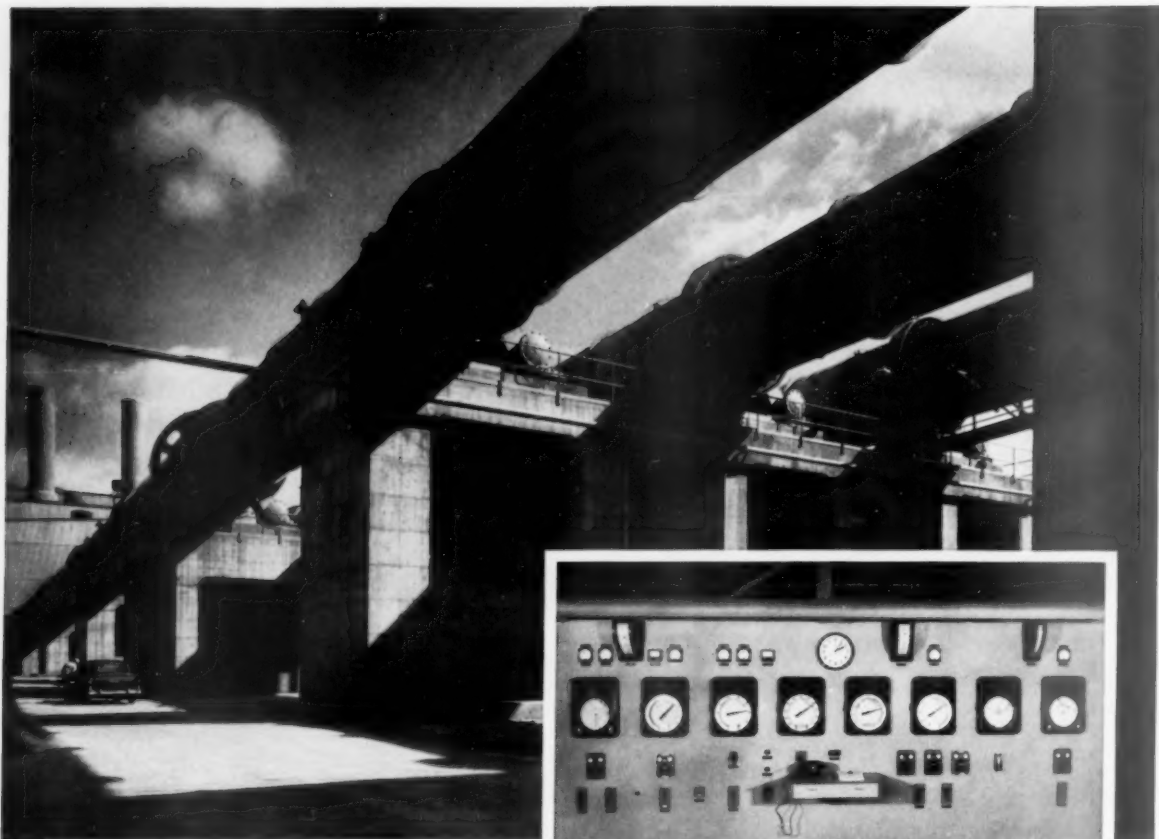
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IN CANADA: A. P. Green Fire Brick Co., Ltd., Toronto 13, Ontario

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All kilns operated by Missouri Portland Cement Company are equipped with modern Bailey Instrumentation and Control Systems.

How to control the digestion of giant kilns

These giant kilns have delicate stomachs. But the Missouri Portland Cement Company knows how to coddle them to get maximum capacity, uniform product and low fuel rate.

They do it with a Bailey Control System with a central Control Panel where a single attendant has complete control of the variables of combustion and heating.

Because the system keeps continuous chart records, the Burner can check the reading and trend of Kiln Speed, Exit Gas Temperature, % Oxygen in Exit Gas, % Combustibles in Exit Gas, Kiln Shell Temperature, Hood Draft, Temperature of Secondary Air Leaving Cooler,

Temperature of Coal-Air Mixture from Coal Mill, Fuel Gas Flow, Feed End Draft, Kiln Speed, Cooler Speed, Cooler Fan Discharge Pressure, Cooler Undergrate Pressure, Cooler Air Flow, Coal Mill Primary Air Pressure, Coal Mill Exhauster Fan Suction, and Fuel Gas Flow.

The system works so dependably that week-long kiln runs have been made without the operator touching anything.

Let a Bailey Engineer help you plan for peak performance! For additional information write for a Bailey Kiln Control Folder.

C-14



BAILEY METER COMPANY

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In Canada—Bailey Meter Company Limited, Montreal

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Gas sampling

continued from page 82

result of maintaining a more even operating temperature, the importance of analyzing oxygen in the effluent gas of rotary kilns can be understood.

Four rotary kilns were involved, three 9 ft. diam. and 314 ft. long, and one 9 ft. diam. and 324 ft. long. These kilns presented major obstacles to the successful analysis of kiln combustion gases, combining a combustion process with gas sample temperatures up to 1,100 deg. F. and dust loading with particle size down to 3 to 5 micron.

In the combustion process, maximum combustion efficiency can be attained only when sufficient air (oxygen) is present for complete burning. Too little oxygen means unburned fuel. Too much oxygen can cool the kiln unnecessarily and waste heat out of the stack. Continuous maintenance of correct fuel-air ratio, as indicated by the percentage of oxygen in the flue gases, will assure maximum firing efficiency.

Why is there such a problem in gas analysis of these rotary kilns? As in any combustion process, water is a by-product. When the gas temperature drops below 300-350 deg. F., the water vapor begins to condense. If dust is present at that point, a clogged sampling line is certain to result.

The system at Dragon Cement prevents this condensation, allowing continuous gas analysis to provide efficient combustion and to aid in maintaining even operating temperatures within the kilns.

Holding temperatures within the kiln at an even point has two big advantages. First and foremost, a more uniform product results. Secondly, unvarying operating temperature enables a kiln to operate longer without relining, since expansion and contraction due to temperature change are held to a minimum.

Three kilns are equipped with instruments made by the Hays Corp. The fourth kiln has a Leeds and Northrup Co. instrument.

END

Wet grinding methods

continued from page 110

The latest wet-grinding circuit used in the cement industry consists of an overflow rod mill grinding to 14 mesh in open circuit, followed by a Ballpeb mill (tube mill) also operating in open circuit.

The rod mill is able to grind to a top size in open

circuit. Rod mills have been used for many years in the mining industry to prepare ball-mill feed, and have been capable of grinding to 10 to 14 mesh with a minimum of tramp oversize.

This leads back again to the idea of controlling the feed to the last stage of grinding. A rod mill is capable of doing this without the production of tramp oversize, and does not need screens to close-circuit the rod mill.

The rod-mill tube-mill circuit has a considerable amount of appeal in eliminating the need of screens and pumps. By proper layout, the rod mill can discharge into a scoop feeder box for a scoop feeder on the Ballpeb mill, thereby using the minimum amount of equipment and space.

As soon as operating data is available, considerable further information will be given on this particular circuit. It appears to have advantages for wet-process plants.

The wet grinding of cement raw materials has certain requirements based on characteristics of the kiln. In most instances, clinker burning is most satisfactory when kiln feed is minus 50 mesh, with few extreme fines. In meeting these requirements, the compartment mill is the simplest circuit to install and operate, but tramp oversize and considerable overgrinding are linked with its high power consumption. However, the Compeb mill is the circuit from which the later wet-grinding circuits were developed and still is frequently installed.

Of the circuits used in the industry over the years, certain ones met with limited success. The ball mill in closed circuit with a bowl classifier, Fig. 4, and a Compeb mill using a cone classifier, Fig. 7, may be used for raw materials that can be thickened. The basic compartment mill with a screen for fine separation, Fig. 5, cannot develop high enough circulating loads to give the full effect of a closed circuit mill.

Successful innovations in the field are those maintaining some form of size control to later stages of grinding. An early form was the ball-mill tube-mill circuit, Fig. 3, with the ball mill in closed circuit with a screen. A later improvement in size control was the peripheral discharge compartment mill with vibrating screen (Fig. 6) which itself was based on an earlier version, sound in theory but which proved to be disappointing in peripheral screen results, Fig. 2.

The latest method of grinding cement raw materials is the rod-mill tube-mill combination. With the twin advantages of top size control and lower power requirement (though not as low as ball mill in closed circuit) per ton, this arrangement should give the best results for the cement plant operator.

END

BARITE PRODUCTION in Union of South Africa totaled 2,713 short tons in 1956, compared to 1,892 tons in 1955.

Rotary drill

continued from page 100

helix traveled by point A is greater than that for the larger helix traveled by point B. The clearance angle should increase toward the center of the bit. The angle of cut (helix angle) determines the minimum clearance angle necessary to allow cutting to take place at a given point.

The required clearance angle is given by the general equation:

$$A = \tan^{-1} \left[\frac{\text{penetration speed}}{\text{spindle speed } (2\pi R)} \right]$$

where:

A—the minimum clearance angle in degrees.

R—the radius of the bit in inches.

Penetration speed is in inches per minute.

Spindle speed is in rpm.

The cutting edge will rub at any point where the angle of cut and the clearance angle are equal. The effective drilling force is appreciably reduced when even a small amount of rubbing takes place. The above equation also can be used to determine the area in which rubbing occurs if the clearance angle, penetration speed, and spindle speed are known.

The face cutting angle is measured from the axis of the bit. For drilling in the softer formations, an angle of 60 deg. has proved satisfactory. Where the angle between the axis of the drill and the rock face is less than 90 deg. the smaller face cutting angle may be needed to collar the hole. A bit with little or no side taper or side clearance will bind in the hole. For drilling the softer stone a taper of 3 deg. and a side clearance of 20 deg. is satisfactory.

A slightly rounded tip or radius at the gauge of the bit strengthens the cutting edge by decreasing the stress concentration. Tests have shown that an increase in curvature causes an increase in the tendency of the bit to stall. For drilling relatively soft rock, a sharp gauge is best. For harder rocks, a slightly rounded radius will increase bit life.

The harder grades of tungsten carbide used for the insert give the best drilling rate. The standard method for measuring hardness of cemented carbide compositions is the Rockwell test on the "A" scale. This hardness reading is not a true indication of the hardness of the individual carbide grains but rather measures the amount of binder composition and the mass of the carbide grains. Tests have shown cemented carbides having a hardness between 90 to 92 on the Rockwell "A" scale give good drilling rates with reasonable bit life. A composite cutting edge in which the center

insert is softer and more shock absorbing usually shows better results.

Examination of the cutting edge of the bit shows wear by cratering or chipping and abrasion. The exact nature of this wearing-away process is not wholly understood. Stresses set up within the insert may cause it to chip and be broken off. The scouring action of these chips across the insert face may cause much of the abrasion. It is possible a melting or plastic flow also might take place at the gauge. Additional study is required to gain a full explanation of this wear action.

An important factor in tungsten carbide insert life is the reduction of brazing stresses. A sheet of copper stock .01 in. thick placed between the insert and the bit body reduces brazing stresses that are set up as the bit cools.

The patterns of blast hole rotary bits vary broadly in keeping with the mineral strata encountered. Each style has its proper application. Most commonly used are the finger or drag bits, usually in three-cone patterns. There are also the special requirements of fluid or air drilling, plus those designed to cut stone of varying hardness.

Drag bits are used for the softer formations where bit replacement costs are low. The courses in the bits, designed for either air or fluid drilling, are made from high tensile alloy steel castings, heat treated and hard surfaced.

The most popular and efficient bits for sustained drilling in hard, abrasive ground are the roller type. These are manufactured with two, three and four-cone patterns. The three-cone type is by far the most popular and universally used. It cuts well in soft, medium hard and abrasive formations but when ordering, the type of rock should be specified.

SOME TYPICAL ROCKS

Hard abrasive formations: chert, chat, pyrite, quartzite, dolomitic sand rock

Hard rock formations: limestone, dolomite, dolomitic limestone, hard shale, hard anhydrite

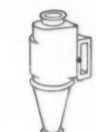
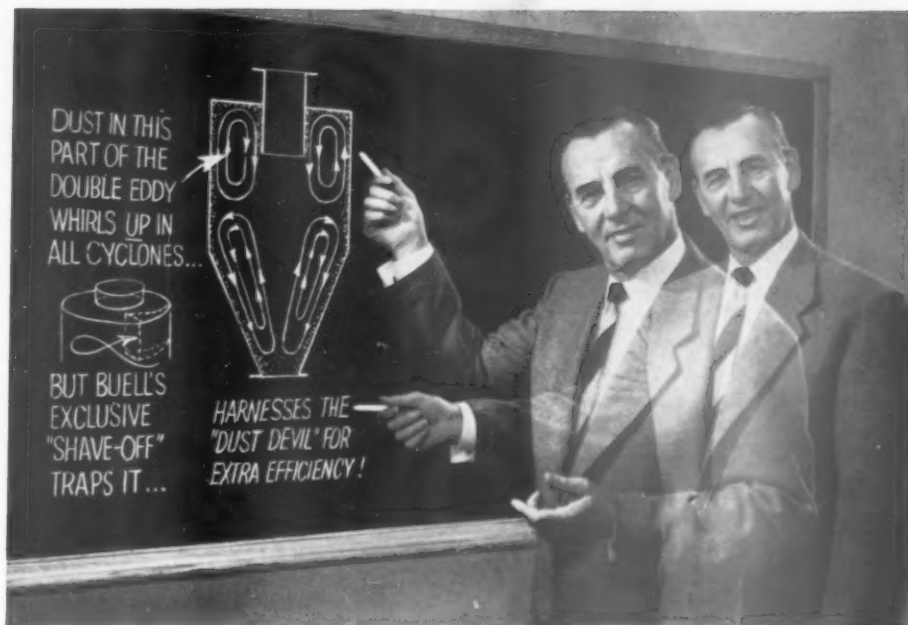
Medium hard rock formations: placer sands, shale, salt, red bed, anhydrite, chalk

Unconsolidated, broken and medium rock: shale, salt, chalk, gypsum, red bed, anhydrite, medium limestone.

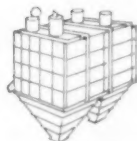
Rotary drilling is fast when in soft, damp or relatively wet rock formations which cave readily, or where high bottom hole pressures are encountered. The cutting action is positive because the cutter is attached to the revolving drill pipe. This pipe is heavier than ordinary well casing, resistant to twisting and capable of withstanding high pressure and impact loading.

END

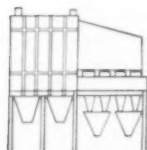
Mastering the double-eddy dust devil leads to extra dust collection efficiency!



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Only Buell Cyclones have the "Shave-off" that removes the fines carried in the double-eddy currents, minimizes reentrainment, assures measurably higher dust collection efficiency! Other exclusive extra-efficiency features include *large-diameter* design that eliminates bridging and clogging, proper proportioning for maximum dust separation from the gas stream, extra-heavy-gauge, wear-resistant construction, Buell-designed manifolding that minimizes draft loss, minimizes scouring and eddying. For more information send for a copy of the booklet, "The Exclusive Buell Cyclone." Dept. 17-H, Buell Engineering Company, Inc., 123 William Street, New York 38, N. Y.

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ROCK PRODUCTS, August, 1958

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LOW COST POWER For Fast "Secondary Breakage"



FREDERICK CAST SEMI-STEEL DROP BALLS

Tough, rugged Frederick Drop Balls give you crushing power where you want it, when you want it . . . cut down expensive drilling or blasting . . . give long, economical service with little or no maintenance. Exclusive "Pear shaped" design withstands greater impact—drops straighter. "E-Z Swing" recessed steel eye gives cable protection plus free swinging action. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Nickel alloy standard on all 4000 lbs. or over—or special alloys furnished on request. Balls can be furnished with replaceable pins. Special release hooks for free dropping also available.

Write us today for prices and illustrated literature. Order Balls direct or see your nearest Equipment Dealer.



Wide Range of Sizes and Weights:

Pear shape (lbs.).....	1500	2000	3300	4000	5200	6500	8000	10,000
Bell shape (lbs.).....	300	1000	2000	5200				
Spherical shape (lbs.) ..	470	950	1650	2400	3000	3700	5400	6900

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HAYWARD BUCKETS

CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

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American's merger

continued from page 73

years' production will be taken up by the Glen Canyon Dam, on which American bid successfully. Although Riverside had planned to build this plant, American can more easily assume its obligations.

American also plans to rebuild Riverside's Crestmore plant and enlarge the Oro Grande facilities in keeping with market growth. And they are eyeing a number of localities for the prospects of future growth.

"It doesn't do any good to be big," says Bob Morrison, "unless you also have imagination. We think that the cement industry is going to make substantial technological advances in the years ahead. We want to be in a position to take full advantage of them. We feel a pooling of talents through a group of companies such as American will be in a better position to make progress."

This is the sort of thinking that is permeating everyone at American. They point with satisfaction to the fact that southern California has a population growth about 150 percent above the national average—and a per capita consumption of cement also well above average. Michigan's growth potential and per capita consumption is also above the national average, while the seven states served by Hercules account for about one-fifth of the total U. S. cement consumption.

"The present highway program," points out Don MacBride, "is just a foot in the door—only a beginning. More roads will cause more cars to drive more miles. It's going to grow far beyond what we now envision, and the demand for cement is going to grow with it."

American not only expects to be around to take advantage of the growing demand—it hopes to be ahead of it. And in the process it hopes, also, to attract as partners other companies who want to take full advantage of bigness without losing any of the benefits of individual operation and identity. It's a persuasive argument, and so far it has worked very well for this newest entry among the top-half-dozen cement companies of the United States.

END

Thermal insulating materials

DEVELOPMENT OF SPECIFICATIONS and methods of test for thermal insulating materials has been conducted by American Society for Testing Materials, 1916 Race St., Philadelphia 3, Pa. The information is carried in the publication, "ASTM Standards on Thermal Insulating Materials," available from the society for \$3.00 a copy.

"Not merely to sell; but to serve . . . not only to make good steel products; but to make them still better . . . not only to fulfill today's requirements; but to anticipate tomorrow's—these are the principles that constantly guide CF&I."



G. F. Franz
President

Grinding Mill Bulletin #1

CF&I is firmly convinced of the value—to us as well as to our customers—of our president's words, quoted above. In line with this principle, we are now commencing a series of ads designed to add important technical facts to the mining industry's store of knowledge on more efficient grinding mill operations. We have purposely restricted the subject matter of these ads so that they will be of interest to only one segment of the readers of this magazine—grinding mill operators. And this is right in line with CF&I's policy—"not merely to sell; but to serve."

Grinding Ball Rationing of the Makeup Charge

A practical means of improving many grinding mill operations is to determine the optimum size assortment of grinding balls that should be added as a makeup charge.

Increased Milling Throughput Reduces Milling Cost

Total milling cost will *decrease* as number of tons processed (throughput) *increases*. This advantage can be realized in any plant, provided that the rate of mining and all steps in ore processing can be increased to match the greater throughput of the ball mill, which makeup charge rationing makes possible.

Indications That Rationed Charge Is Needed

When a one-size ball addition to a mill is being established, the following conditions may indicate that ball rationing is warranted:

- 1) There may be a certain amount of tramp oversize that can be reduced by replacing a portion of the balls by a larger size.
- 2) There may be a crowding of particles of reduced size but not of finished size, showing a deficiency of small-size balls.

When a new mill is started up, time is needed to get the process running smoothly. To add a further problem of determining a makeup ration during this start-up period would be ill-timed.

Ball Wear Pattern

When balls of one size are used for addition, the seasoned charge in the mill ranges from balls of the original diameter to those small enough to purge from the mill. If a screen analysis of the ball charge is made using screens with openings of equal increments, such as $\frac{1}{2}$ inch, the weight of the balls on each screen will show a certain pattern or distribution of the charge by weight. Apparently the rate of wear of different ball sizes in the charge is affected by the size structure of the mill feed and by the crystal size of the minerals. Also, the physical and metallurgical characteristics of the ball may vary with the distance from its center.

There is evidence that there is a difference in the wear pattern of grinding balls of different manufacture. Some appear to be *self-rationing* while others do not. This self-

rationing quality, the built-in ability to wear evenly and give longest possible service life, is an important feature of CF&I Forged Steel Grinding Balls. Proper analysis steel, and continuous control and inspection at every stage of production help CF&I to impart this self-rationing quality to its grinding balls.

Impact, Nipping and Attrition Grinding

Large balls in the charge drop with greater impact and also have a more effective nipping action on the larger particles. Small balls make a greater number of contacts (since there are more of them), so that attrition grinding is more effective. Fine crushing is increased due to greater nipping action incidence on the small particles. Ball rationing is employed to change the size distribution of the ball charge to one that has a better ratio of impact, nipping and attrition.

Not All Mills Should Attempt Ball Rationing

Most small mills, and some of the larger ones, do not have the facilities to blend mine run ore for mill feed. With a great variation in character of feed, establishing even an optimum single-size ball charge may be a difficult problem. Facilities, personnel, and sufficient time may not be available for careful testing. The cost of such an effort may not be justified. Total savings in dollars and cents, through a relatively minor improvement in grinding practice, will not be as great in a small operation as in a larger one. Nevertheless, it appears obvious that, for many operations, the attaining of an ideal ball ration can increase the efficiency of milling sufficiently to warrant the effort involved in its development. Other pertinent factors will be discussed later in this series.

For a reprint of the article on which this ad is based, please write on your company letterhead to: Mining Supply Department, The Colorado Fuel and Iron Corporation, P. O. Box 1920, Denver, Colorado.

OTHER CF&I STEEL PRODUCTS FOR THE CEMENT INDUSTRY

CF&I Grinding Rods • CF&I Grader Blades • CF&I Industrial Screens
CF&I Mine Rail and Accessories • Wickwire Rope • CF&I Rock Bolts

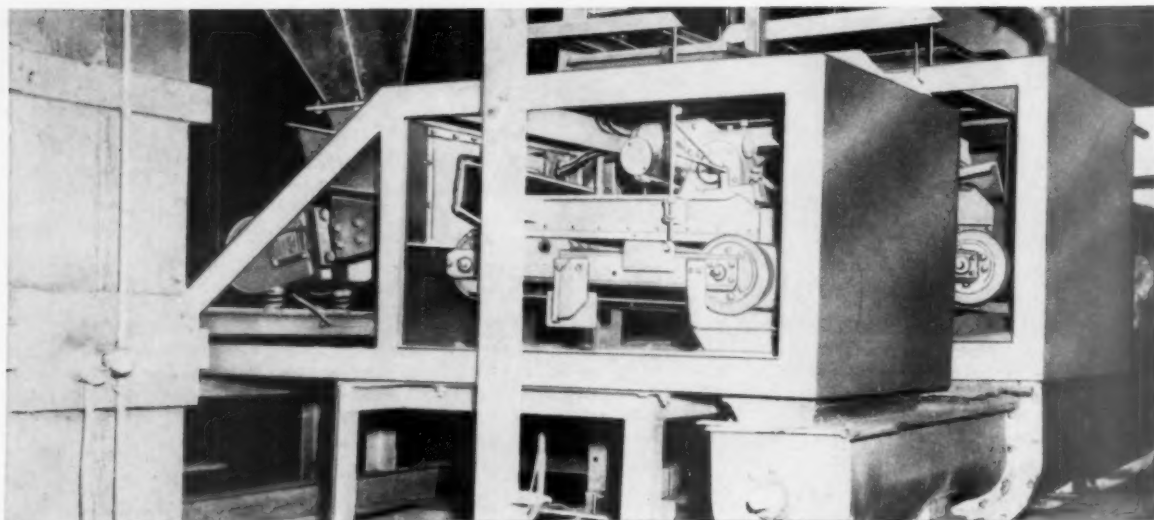


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GRAVIMETRIC FEEDERS

for continuous, accurate, controlled materials feeding by weight

SYNTRON "weigh-flow" Gravimetric Feeders are the most accurate and most mechanically dependable weigh-feeding equipment available.

Fully automatic — feed rate is electronically controlled by the load on a scale-suspended, constant speed conveyor belt. Any deviation from the precise, pre-determined weight adjusts the flow of the supplying feeders to precision accuracy.

SYNTRON "weigh-flow" Gravimetric Feeders will keep mixers and dryers accurately supplied at their best, most profitable production capacities.

Two or more, feeding into mixing and blending machines, will produce mixtures of precisely exact proportions for highest product uniformity.

Simple and functional design, with a minimum of moving parts, SYNTRON Gravimetric Feeders are built for long, dependable, trouble-free service.

SYNTRON Gravimetric Feeders are available in a standard range of sizes and styles. Capacities range from pounds to 100 tons per hour.

Our application engineers will be glad to submit recommendations for your particular feeding-by-weight problem. RP658

Builders of Quality Equipment for more than one-third of a century

Other SYNTRON Equipment of Proven Dependable Quality

designed to increase production, cut production costs, improve products

Vibrators
(bins, hoppers, chutes)
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Vibratory Screens
Shaker Conveyors
Vibratory Elevator Feeders
Weigh Feeders

Packers and Jolters
Hopper Feeders
Lapping Machines
Rectifiers
(Silicon and Selenium)
a-c to d-c Selenium Rectifier Units
Electric Heating Panels

Electric Heating Elements
Sinuated Wires
Shaft Seals
Electric Hammers
Concrete Vibrators
Paper Joggers

Our representatives will be glad to work with you in selecting the proper equipment for your operation.

Call your nearest Syntron representative

Write for a SYNTRON
Illustrated Catalog — FREE

SYNTRON COMPANY
450 Lexington Ave. Homer City, Penna.

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Why wash aggregates?

continued from page 75

the material suitable for use. If the sand is not available or contains too much dirt, either the sand or the original fines may have to be washed to meet the plasticity specifications.

For those contemplating production of road materials, plasticity index (P. I.) is defined as the difference between the liquid limit and the plastic limit. It is the range of moisture content through which the soil is plastic.

Liquid limit is defined as that moisture content, expressed as a percentage by weight of the oven-dried soil or binder, at which the soil will just begin to flow when jarred slightly. Grain size or particle size has a definite bearing on the liquid limit.

Plastic limit is defined as the lowest moisture content, expressed as a percentage by weight of the oven-dried soil, at which the soil can be rolled into threads $\frac{1}{8}$ in. diam. without breaking.

The plasticity index is most generally applied to material passing the No. 40 mesh sieve. A common value for plasticity index is one not to exceed six, although some states permit up to nine and at least one allows 15 on specific materials. When the plastic limit is equal to or greater than the liquid limit, the plasticity index is considered to be zero. When the plastic limit cannot be determined, the plasticity index may be designated by the letters NP (nonplastic) to indicate that the soil is entirely lacking in plasticity.

Aggregates for buildings. Aside from those producing materials for highway construction, a great number of producers provide aggregates for building construction. Typical architect's specifications for aggregates for reinforced concrete read something like this:

"Concrete aggregates shall conform to ASTM Designation: C33, except that aggregate for exposed outside concrete, other than sidewalks and drives, shall conform to the 'recommended permissible limits' and shall not have more than one percent shale in coarse aggregate and three percent in fine aggregate."

Thus it is apparent that the producer of aggregates, regardless of his market, must meet strict standards.

END

FOSFORITA OLINDA S.A., said to be the largest phosphate rock producer in Brazil, has a capacity of 250,000 tons per year. The company plans to export about 70 percent of its production to Southern Brazil, reserving the remainder for distribution in Northeast Brazil.



STARSTEEL HEAVY DUTY SPACE SCREENS

In many cases, the life of STARSTEEL Screens is more than double ordinary screens! The wear-resistant high-carbon STARSTEEL wire is specially made to take the brutal pounding and abrasion of the most rugged screening jobs with minimum wear.

Another reason Star Screens stand up better is the greater precision in weaving—the freedom from buckling and distortion—the absolutely square, accurate hook ends or strips that guarantee tighter, more uniform tension and longer service.

The tougher the job, the more you'll appreciate STARSTEEL Screens!

Most weaves and sizes ready to ship. Ask for catalog.



Star will produce screens or cloth from stainless or other steel alloys, Monel, brass, bronze, copper, aluminum or any metal that can be drawn into wire. Inquiries invited.

WIRE SCREEN & IRON WORKS, INC.

2515 San Fernando Road • Los Angeles 65, Calif.

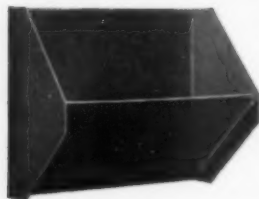
Subsidiary of Ludlow-Saylor Wire Cloth Company, St. Louis, Mo.

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Long-lasting
Efficient
Economical**

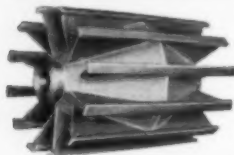
STANDARD METAL'S CONTINUOUS ELEVATOR BUCKET STYLE No. 2



Provides outstanding service and economy under severe operating conditions. It resists wear—assures longer bucket life. This style of bucket is just one of the complete line of low-cost, rugged steel buckets manufactured by Standard Metal. Available in Salem, Style "A" and other continuous style buckets.

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STANDARD METAL'S BIN GATES



Shown is the all-steel gear-operated Bin Gate for faster, easier, lower cost material handling. Other types of Bin Gates by Standard Metal also available.

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Write today for complete details and quotations on your needs in elevating and conveying equipment. We also will send you the catalog showing the complete Standard line.

SM6



STANDARD METAL MFG. CO.
111 CENTER ST. MALINTA, OHIO

Isotopes

continued from page 93

at a harmless level. Safe levels of exposure are termed "maximum permissible" levels, and they vary with the nature of the hazard. Safety precautions in laboratories where a variety of isotopes are handled are, by necessity, much more stringent than in a factory where a single isotope is used for a special purpose.

In laboratories, loose or unshielded radioactive materials are a potential hazard because the electrical charge of radiation makes it adhere to dust and other particles in the air and on surfaces. Since removal from the rough surfaces of concrete, wood, or unfinished steel would be difficult, glossy paint, stainless steel fittings and smooth, glossy floor surfaces are used.

Industrial instruments made by reputable manufacturers are completely safe and can be handled easily. These instruments embody suitable shielding designed to keep exposure within the safe permissible level fixed by the authorities. In general, many of the machines and chemical substances used in industry, and readily accepted in everyday practice, are actually more dangerous than the use of isotope techniques.

END

Oolite producer

continued from page 77

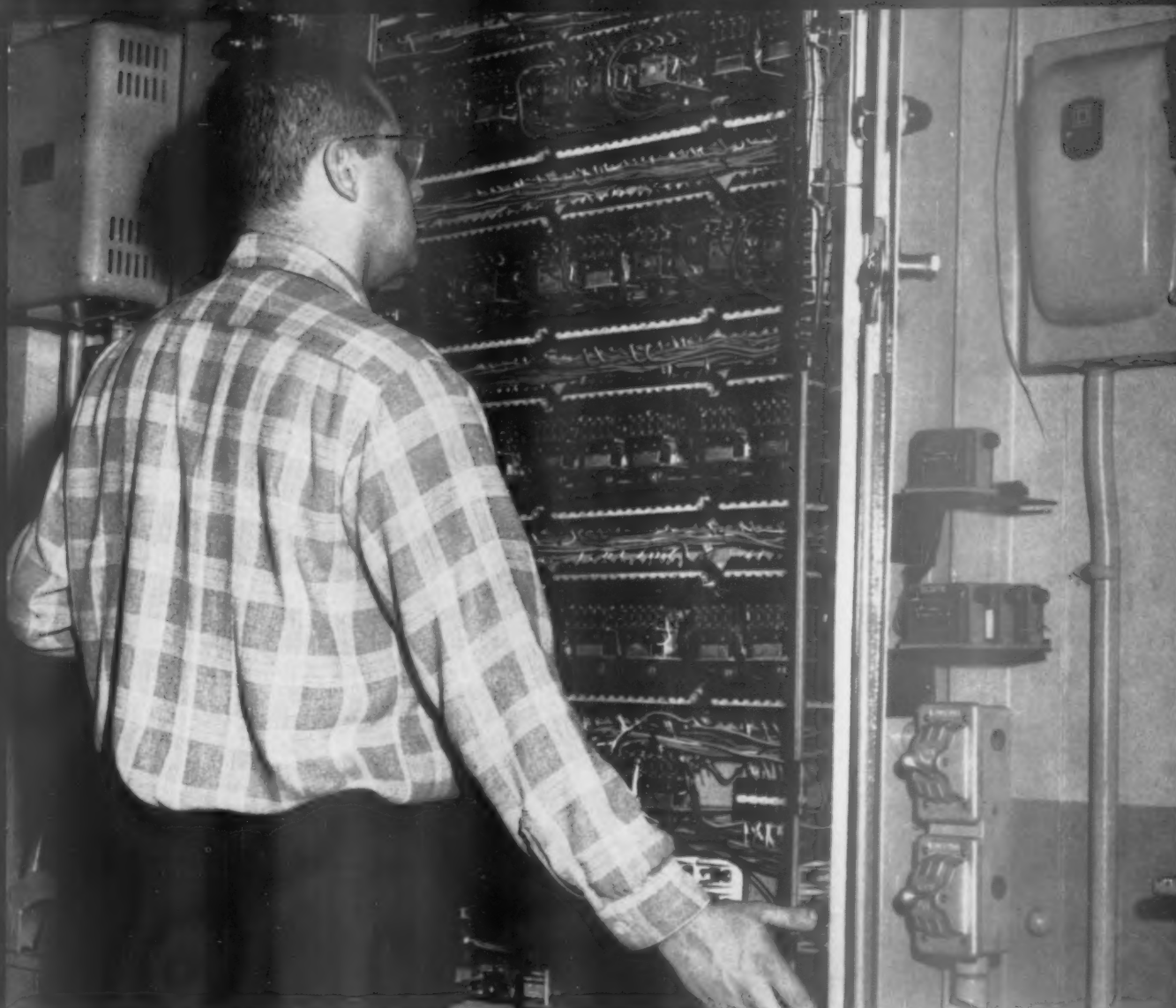
section. Fines are moved to a hydraulic scalper. Two grades of sand, a concrete and a masons sand are made and stored on the ground. This scalper can classify the sand into 27 different grades, if needed, and about 160 tph. of sand is produced.

The water scalper is 32 ft. long and is mounted far enough from other structures to prevent foreign matter from falling into it. Discharge gates are automatically opened and closed by individual paddles over each of nine outlets. When the sand in one of the pockets builds up enough to retard the paddle's action, the gate opens. When the load is drained off, the gate closes.

There are three flumes under the nine unloading spigots: one for concrete sand, one for masons sand and one for waste. A great amount of flexibility in blending is possessed by this classifier. Sand blended for masons sand is screened over a small vibrating screen before the material goes to its de-watering screw. Concrete sand goes to another set of de-watering spirals. Two 8-in. pumps deliver 5,000 gpm. of water for washing.

Please turn to page 128

Enter 1048 on Reader Card



BEHIND THE SCENES at the new electronically controlled, fully automatic factory for making Du Pont Electric Blasting Caps (both regular and delay).

Automatic loading and electronic controls give you Du Pont Electric Blasting Caps that are even more reliable, more uniform than before

Let us take you behind the scenes at the world's most modern blasting cap plant. Then, you'll see why Du Pont Electric Blasting Caps, both regular and delay, are years ahead in reliability, uniformity and dependability.

Any possibility of human error has been completely erased from this scene. Every step in the process, from automatically loading the shell (and inspecting it 3 times during loading alone), to applying the shielded shunt and paper band is controlled electronically.

This revolutionary approach

means that every Du Pont electric blasting cap—regular or delay—*must* meet our rigid standards at *every step* or it will be automatically rejected by one of the dozens of electronically controlled "watchmen."

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Electric Blasting Caps are even more uniform, more reliable, more dependable than ever before.

And you get all these benefits at **NO INCREASE IN COST.** Call your Du Pont representative or write to E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

DU PONT BLASTING CAPS

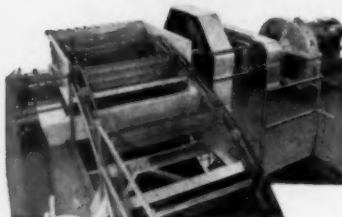


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and
builders
of
equipment
for
basic
industries

Conveyors



BULK material conveyors built by McNally Pittsburgh are tough, wear resistant, geared for heavy loads and specifically designed for the job you require.

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Performance

WILFLEY
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and SONS, Inc.
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ROCK PRODUCTS
THE
RECOGNIZED AUTHORITY
OF THE
NON-METALLIC
MINERALS INDUSTRY

Oolite producer

continued from page 126

All screens operate wet. With one exception, sand fractions from all screens go to the scalper tank. The exception, a single screen mounted over cylindrical bins which provide "B" concrete rock, discharges to the concrete sand screw.

The rock from the secondary crusher goes to the final screening section, where one 5 x 12-ft. and two 5 x 16-ft. screens complete the washing and classification process.

The classified material is stored over a 400-ft. reclaiming tunnel with a single belt 545 ft. long. This conveyor carries the materials to a loading hopper over the Seaboard Railroad tracks. Ground-stored material can be loaded onto trucks by a 2½-cu. yd. front-end loader which normally fills a 22-ton capacity truck in 3½ min. A small clam-shell rig is available for miscellaneous loading, and a tractor is used for car-spotting.

A plant laboratory for control purposes is provided close to the final screening tower. All material hauled by truck is weighed at the plant.

The seven sizes of crushed rock produced are as follows: 1½ x 1 in., ballast; 1 x ¾ in., drain field rock; ¾ x 7/16 in., concrete rock; 7/16 x 5/32 in., pea rock; specification rock for blending on the tunnel belt are: ¾ x ½ in.; ½ x ¼ in. and ¼ x 3/32 in.

END



THAT'S THE BOSS' SON — HE'S REALLY
STARTING AT THE BOTTOM —



Wet clay and shale build up 20" thick on hopper walls, but Wobbler Feeder bars remain free and clean as they scalp off sticky fines.

Wet clay was no problem for this all weather UNIVERSAL plant

"Our Wobbler Feeder-Impact Master combination helped us shorten a 60-day road stone contract by three weeks"

says Lloyd E. Quarve, Quarve & Anderson, Rochester, Minnesota

"In the summer of '57 we had a road contract on Minnesota Route 30 for 100,000 tons of 1½" — and 30,000 tons of ¾" aggregate to be produced in 60 days.

"The quarry was full of broken limestone mixed with clay and shale—tough to work under normal conditions — nearly impossible after one of our frequent torrential rains.

"In previous years under soggy conditions, our output would drop one-third — with plenty of overtime needed to dig out the equipment and catch up on lost tonnage.

"But all this trouble is behind us now with our Universal plant. This is a 4650 Impact Master with a 9" pitch Wobbler

Feeder ahead of it; a portable combination with good production, rain or shine.

"During the Route 30 job, we got some heavy downpours that would have meant the same old problem. Ten per cent of the feed was clay, shale and broken stone under two inches. With the Wobbler taking this out ahead of the Impact Master, we stayed right on the job producing at full capacity day after day . . . and finished the Route 30 job *three weeks* ahead of our 60-day deadline."

Universal Impact Masters are "all-weather," performers. They are designed to insure unimpeded crushing action. Construction of the rock-breaking chamber prevents buildup of wet, sticky materials. The straight-line flow of material from entry to discharge keeps

rock moving without interruption.

Fines go through Wobbler bars to an under conveyor. Wobbler separation of sticky material guarantees increased efficiency and capacity of any crusher.

Combine the self-cleaning Universal Wobbler with an Impact Master and you, too, will have an unequalled crushing equipment team!

Patented Wobbler Feeders together with different kinds of crushers are at work everywhere. To help you with your problem; tell us the size of fines to be separated, the percentage of fines this size in the feed, and the desired tons to be handled per hour. We will recommend the right size Wobbler and other equipment best suited to your needs — at no obligation.



UNIVERSAL ENGINEERING CORPORATION

617 C Avenue, N.W., Cedar Rapids, Iowa

Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

Stouffville Sand and Gravel

continued from page 79

18 in. wide inclined belt-conveyors. Since the smallest fraction has the greatest volume, the stacker conveyor system has been designed to make two piles of material. The inclined belt conveyor from the vibrating screen can discharge directly to a storage pile or to another inclined belt conveyor to make a second, deeper pile.

EQUIPMENT USED AT STOUFFVILLE SAND AND GRAVEL, LTD.

In gravel pit:

Shovel, $\frac{3}{4}$ cu. yd.	Northwest Engineering Co.
Portable crushing plant	Iowa Mfg. Co.
Stacking belt conveyor	Barber-Greene Canada, Ltd.
Bulldozer	Caterpillar Tractor Co.

In washing plant:

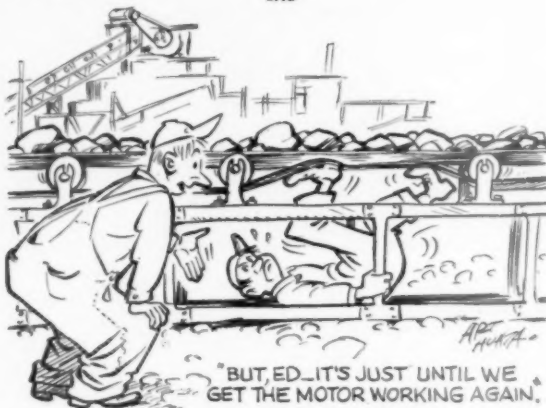
Haulage trucks	Ford Motor Co. of Canada, Ltd.
	General Motors of Canada, Ltd.
Clamshell	Northwest Engineering Co.
Belt idlers	Link-Belt Ltd.
	Dodge Mfg. Corp.
Belts	B. F. Goodrich Rubber Co. of Canada, Ltd.
	Dunlop Tire & Rubber Goods Co., Ltd.
	Gutta Percha & Rubber, Ltd.
	U. S. Rubber Co.

Sand classifier, 15 ft. Rotoscoop	Link-Belt Ltd.
Vibrating screen, 6 x 14 ft., 3-deck	
Pump and motor	Canadian Allis-Chalmers, Ltd.
Front-end loader	Clark Equipment Co.
Platform scale, 50 ton	Fairbanks, Morse & Co.
Structural steel	Stouffville Sand and Gravel Ltd.

One of the conveyors has been fitted with a belt which has a herringbone pattern molded into its surface. This belt has improved the capacity of the steeply inclined conveyor. The operators plan to convert all the belts on their inclined conveyors handling wet, washed sand and aggregates to this design.

The new plant is only 25 miles from the concrete products producers in Metropolitan Toronto who take most of the 150 tph. output of washed sand. The need for quality aggregates is so great in the area that ready-mix producers and concrete block makers come more than 50 miles for washed sand and gravel.

END



when
the stone
comes
tumbling
down...



HENDRICK PERFORATED PLATE STANDS UP!

Hendrick H Quality Steel Plate stands up under the toughest, heavy-duty screening of crushed stone. It's made from high carbon or stainless steels. High carbon can be heat-treated after perforation for longer life. It screens faster and easier, while full openings eliminate blinding. Product uniformity is assured throughout the life of the screen. Deck changes are quick, for lowered labor costs.

Hendrick H Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape, and with perforations of any size.

HENDRICK MANUFACTURING COMPANY
47 Dundaff Street
Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Open Steel Flooring
• Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

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Grinding Balls

forged steel—none tougher

none harder—none more uniform



United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company
United States Steel

Guard against these stray current hazards!



THUNDERSTORMS



HIGH TENSION LINES



POWER CABLES



TWO-WAY RADIO



STATIC ELECTRICITY



DUST STORMS

Hook-up and detonate with Primacord!

Blasting authorities recommend the use of Primacord whenever extraneous electricity may be encountered. These unwanted electrical currents can be caused by lightning several miles away — by static due to moving belts, automobile tires, dust storms and even snow storms. Two-way radios, high tension lines and power equipment cables all present stray current hazards.

With Primacord as the detonating agent, you can load and fire when ready without danger from stray currents. Primacord is relatively safe to handle and store. It cannot be set off by *normal* vibration or friction, ordinary impact or sparks, but must be detonated with fuse and cap or electric blasting cap. It is not affected by stray electrical currents, and — according to all available records — has never been fired prematurely by lightning.

Your explosives supplier can give you further information and service.
Use coupon for a free copy of the Primacord Sample Kit.

THE ENSIGN-BICKFORD COMPANY Simsbury, Connecticut

Please send me the Primacord Sample Kit, free.

Company

Address

Attention of Title





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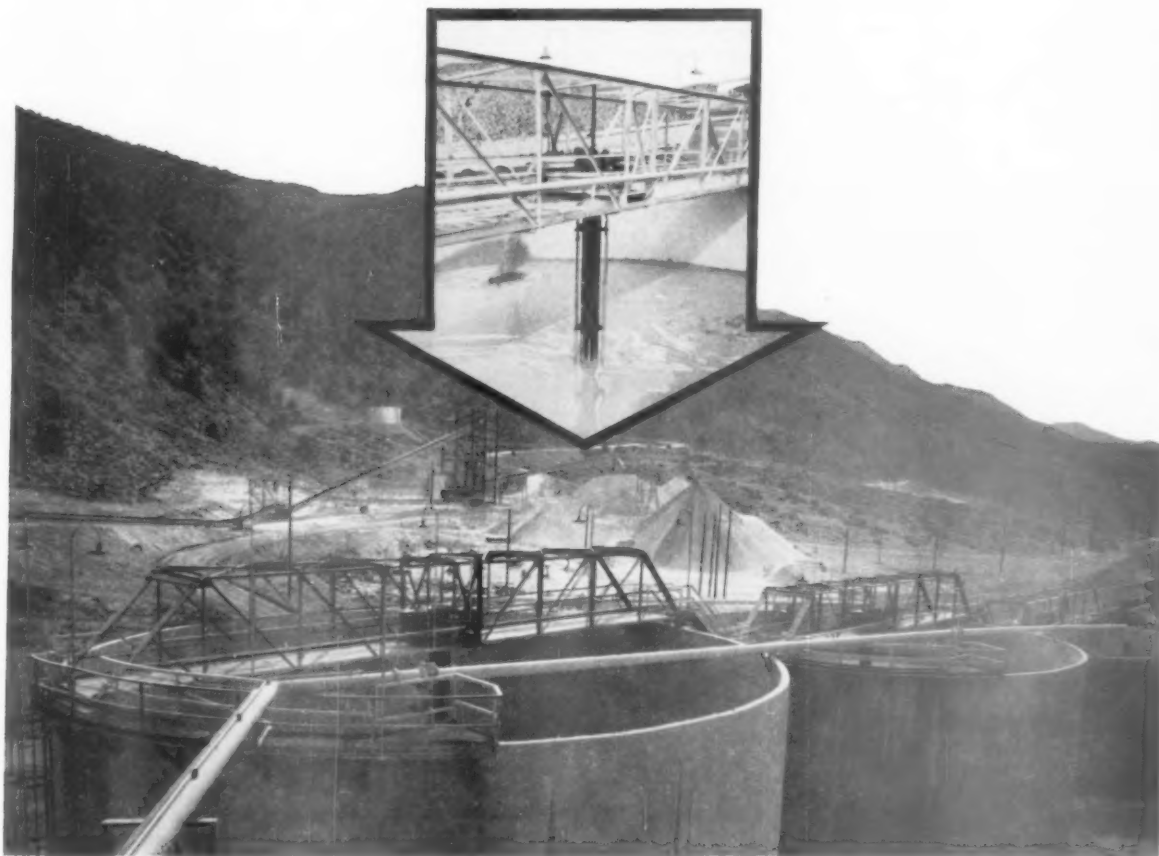
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California's most modern Cement Plant uses DORR Slurry Mixers

Close-up shows one of the Dorr Type BW-100 Slurry Mixers installed in a concrete tank at Permanente Cement Co.'s Cushenbury Plant. The three tanks forming the complete installation appear in the larger photo.



The new \$13-million Cushenbury plant of Permanente Cement Co. is acknowledged to be one of the most modern in the industry. Built to utilize an abundance of on-the-spot raw materials in the Mojave Desert, this plant is now serving the fast-growing construction needs of Southern California.

A highly efficient, streamlined operation such as this is based on equipment of proved capability. Included are Dorr air-mechanical Slurry Mixers, installed in three 65' diam. x 32' deep storage tanks

to provide positive agitation and a uniform, homogeneous mix. The arrangement provides for one tank to be receiving while the second is blending and the third is discharging to the kilns.

Dorr-Oliver equipment is playing an important part in the continuous expansion of the cement industry throughout the world. For information on the complete line, and a brief description of Dorr-Oliver's engineering services, write to Dorr-Oliver Incorporated, Stamford, Connecticut.



DORR-OLIVER

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WORLD - WIDE RESEARCH • ENGINEERING • EQUIPMENT

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ROCK PRODUCTS, August, 1958

135

ROCKY'S NOTES

(Continued from page 20)

him by this kind of tortious conduct cannot fairly be said to be pre-empted without a clearer declaration of Congressional policy than we find here."

To get the full significance of this we go back to the very fundamentals of law as adopted and applied in this country both before and since the government of the United States was established. As British Colonists, the inhabitants of our original 13 States inherited English common law. "Blackstone's Commentaries" on English

laws was a textbook known and studied by the Colonial lawyers, Thomas Jefferson, James Madison, etc., who inspired and wrote the Declaration of Independence and the Constitution of our country. Indeed, the Declaration of Independence was justified by its authors because the Colonists as free-born Englishmen, were being deprived of their natural rights. Even then, incorporated in the common law of England were certain human rights, long upheld by courts of law, which were also so well established in America that the authors of our Constitution did not consider it necessary to include them in that document. To ap-

pease the public some of these rights were subsequently added to the Constitution as amendments and are known as the Bill of Rights.

What then are these human rights, which people with any real concept of freedom from arbitrary rule and tyranny in all forms have sought so jealously to protect? Blackstone defined the rights of persons as of two sorts: "Absolute, which are such as appertain and belong to particular men, merely as individuals or single persons; relative, which are incident to them as members of society, and standing in various relations to each other." In an economically and politically complicated society such as ours, it is obvious that many original absolute rights have had to be modified or circumscribed to keep peace and protect people in their health and safety. However, the theory back of such legislative acts in England and in America, or coded law, is not to deprive the subject or citizen of his natural rights but further to protect and preserve those rights.

Thus all our labor relations laws were predicated on protection of the individual workman's natural right to bargain freely with employers to sell his services to the best advantage. With practices that had grown up through interlocking giant corporations, it was possible for an employer to blacklist a man he did not like, and thus in effect deprive him of his means of earning a decent livelihood. So, arose the theory of collective bargaining and all the subsequent laws, court and NLRB decisions, which permit organized labor to enforce collective bargaining. The employer who refused to employ the man blacklisted for no good reason was committing a tort, or an illegal injury, to an individual, which was a violation of common law, actually little more than an unwritten code of common decency. In this case the legislatures strengthened and coded common law for the obvious protection of the working man.

Now it is organized labor that is the offender in the commission of similar torts against individual workmen. Some of the states have adopted "right to work" laws, which in effect put the common law of torts into written law, specifically to apply to organized labor. The U. S. Supreme Court decisions apparently mean that such right to work laws may be unnecessary in order to hold labor unions responsible for injuries to an individual workman through their "tortious conduct." The chief difficulty seems to be that it takes time, money and determination to carry such civil cases

(Continued on page 139)



MANITOWOC AGITATORS

improve quality
...reduce costs

You will find the modern Manitowoc Slurry Agitators the real answer to your agitating and blending problems, because they combine both mechanical and air agitation, to give you uniform, high quality cement at the lowest cost.

The Manitowoc Agitator has been designed to employ air on an intermittent cycle, as economically as possible, and at the same time employs a unique method of piping which prevents the air line from plugging.

The Manitowoc Central Control Valve is a self-contained, fast acting unit complete with air manifold and valve drive and may be very accurately timed to suit any desired operating cycle.

- Combine air and mechanical agitation
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- Reduce "Step-Bearing" Wear
- Produce Perfectly uniform slurry
- Simple, Fast Acting Control Valve

Manitowoc Agitators have many exclusive features and advantages, and can be engineered to meet your exact requirements even for tanks over 100' in diameter. Write today for full details.

MANITOWOC SHIPBUILDING INC.

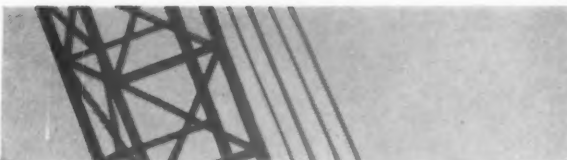
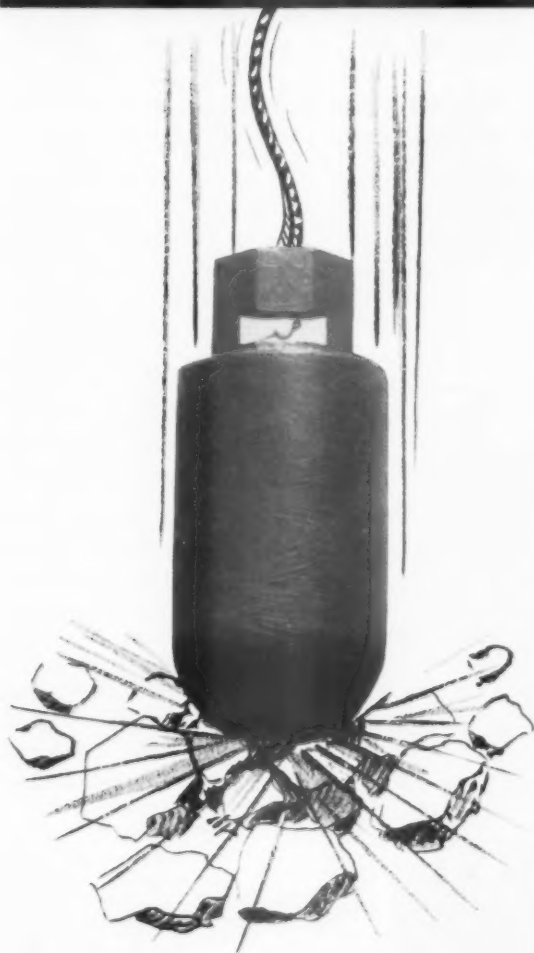
Manitowoc, Wisconsin

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CAPE AN ALLOY DROP BALL

THE NEW FORGED
STEEL DROP BALL
THAT
OUTWEARS
THEM ALL!

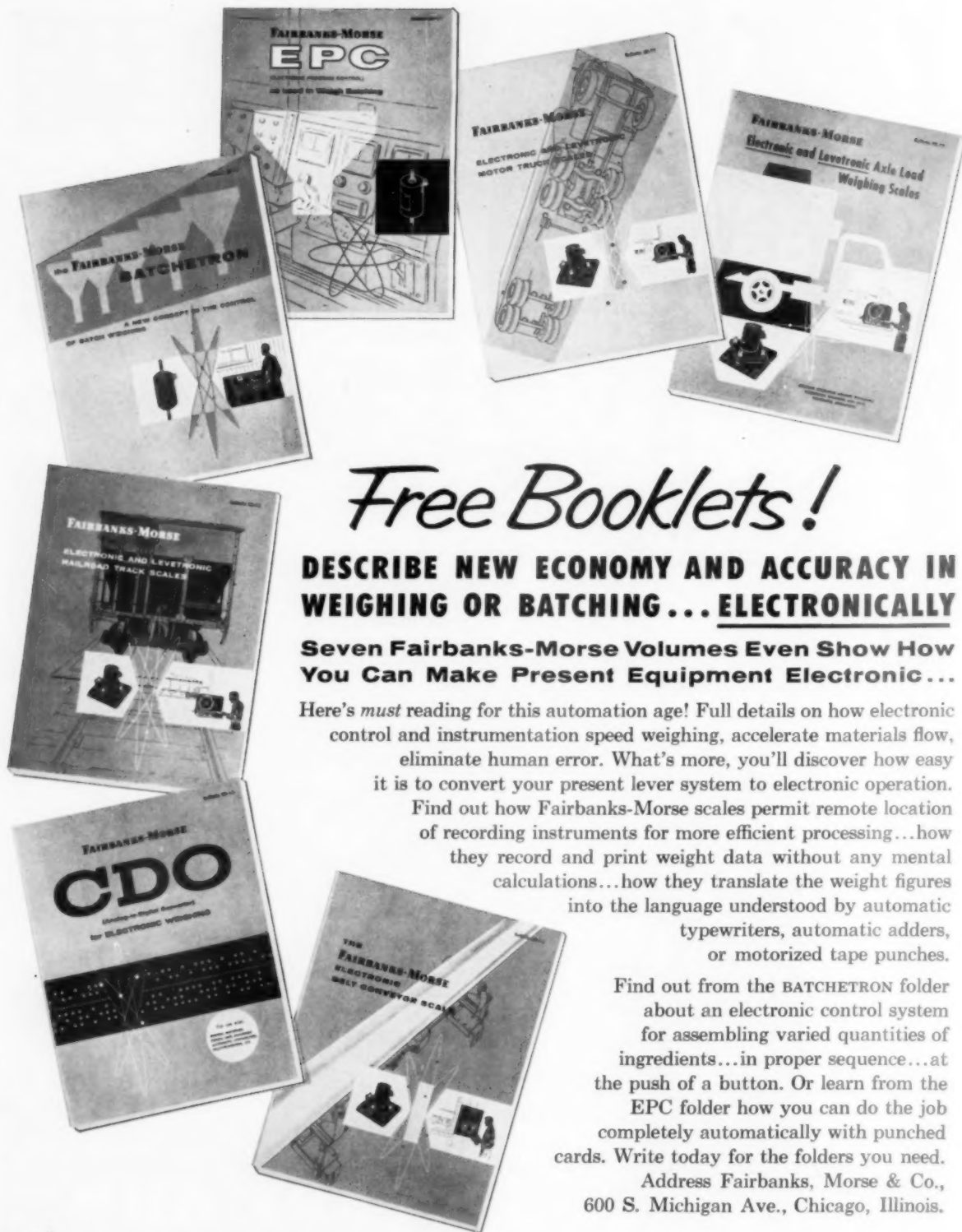


NOW, after three years of development "Cape Ann" offers a SUPER DUTY DROP BALL FORGED (not a casting) from "Cape ANALLOY", a tough abrasive resisting Alloy Steel, for quarries requiring extra hard usage from a drop ball. Field tested in the rugged granite quarries of New England with outstanding results. "Cape Ann" will continue to offer its regular line of Forged Steel Drop Balls that have proved successful in the field for many years to quarries that do not require a super duty type. All "Cape Ann" Drop Balls are SONIC TESTED before shipment. Fully guaranteed against breakage.

FORGED AND
HEAT TREATED
DROP BALLS
from 2,000
to 12,000 lbs.

Your secondary breakage problems will be economically solved when you start using "Cape ANALLOY" Forged Steel Drop Balls. The specialized engineering services and field experience that go into the "Cape Ann" FORGED STEEL DROP BALLS will give you savings away beyond your expectations.

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**Seven Fairbanks-Morse Volumes Even Show How
You Can Make Present Equipment Electronic...**

Here's *must* reading for this automation age! Full details on how electronic control and instrumentation speed weighing, accelerate materials flow, eliminate human error. What's more, you'll discover how easy it is to convert your present lever system to electronic operation. Find out how Fairbanks-Morse scales permit remote location of recording instruments for more efficient processing...how they record and print weight data without any mental calculations...how they translate the weight figures into the language understood by automatic typewriters, automatic adders, or motorized tape punches.

Find out from the BATCHETRON folder about an electronic control system for assembling varied quantities of ingredients...in proper sequence...at the push of a button. Or learn from the EPC folder how you can do the job completely automatically with punched cards. Write today for the folders you need.

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a name worth remembering when you want the BEST

SCALES • PUMPS • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY • RAIL CARS • HOME WATER SERVICE EQUIPMENT • MAGNETOS
Enter 1130 on Reader Card

ROCKY'S NOTES

(Continued from page 136)

to the highest state courts. Here it would appear that one of the most important and patriotic services that can be rendered to society by generous citizens is the maintenance of a legal aid organization designed specifically for the purpose of promoting and maintaining a workingman's natural or inherent rights as a United States citizen—or as a human being.

Courts of civil law were established to right wrongs and establish just administration of the laws. Justice Burton in the quotation we have taken referred to "tortious conduct." A tort is wrong done by one individual to another—or a corporate entity to another or to an individual or individuals. The wrong committed need not be a crime or misdemeanor. It is somehow an infringement of the legal rights of another. It is the function of a court of civil law to right such wrongs, and when this cannot be done directly, it is done by pecuniary recompense, including, according to most state law codes, a penalty for wrongdoing of certain kinds.

According to Blackstone there are three primary or absolute rights pertaining to every individual—"inherent in us by birth and one of the gifts of God to man at his creation, when He imbued him with the faculty of free will." In connection with these absolute rights, Blackstone comments: "The principal aim of society is to protect individuals in the enjoyment of those absolute rights, which were vested in them by the immutable laws of nature, but which could not be preserved in peace without that mutual assistance and intercourse which is gained by the institution of friendly and social communities."

The three principal primary or absolute rights of man, according to Blackstone, are: (1) "The right of personal security—in a person's legal and uninterrupted enjoyment of his life, his limbs, his body, his health and his reputation; (2) personal liberty—the power of locomotion, of changing situation, or moving one's person to whatsoever place one's own inclination may direct, without imprisonment or restraint, unless by due process of law; (3) the third absolute right, inherent in every Englishman, is that of property, which consists in the free use, enjoyment, and disposal of all his acquisitions, without any control or diminution, save only by the laws of the land."

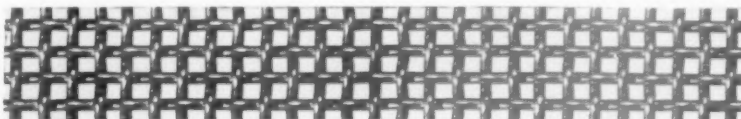
From these quotations one can readily detect the original of Thomas Jefferson's phrases in the Declaration of

Independence, when he refers to the "inherent rights of man to life, liberty and the pursuit of happiness." Our Constitution was designed to assure those rights so far as possible in an organized republican society. It is obvious that such inherent or absolute rights cannot exist in a country or society which has no belief in God. Thus, in communist Russia and similar societies, no absolute rights are recognized, much less protected as such, and man in effect becomes a mere chattel of the state or government, told when and where to go and what to do, without reference to any of those rights listed above as part of

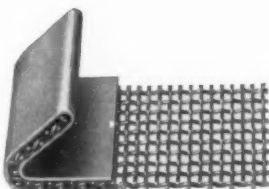
an Englishman's inheritance—and of ours also due to our British origins.

Such press comments on these two U. S. Supreme Court decisions as we have seen would make it appear that management has gained a big advantage over organized labor in having now made unions responsible for illegal picketing, etc. Labor's press, we presume, views the decisions as a triumph of reactionism, and will doubtless urge union officials to exert all political pressure they have toward getting Congress to exempt unions from such responsibility. Union attorneys have the minority opinion of the

(Continued on page 141)



TYLER SCREENS LAST LONGER



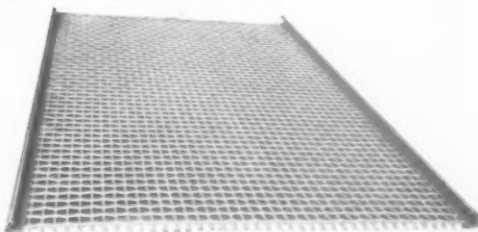
Tyler Type "AX" Hook Strip. For wire diameters from .047" to 5/16" inclusive.



Tyler Type "CX" Hook Strip. For wire diameters .041" and smaller.

Tyler Woven Wire Screens are woven with laboratory approved wires on precision machines. The high quality of Tyler Screens is apparent in their long life and service under the most difficult of screening conditions.

Tyler Screen Sections are furnished for all makes of vibrating screens in all meshes and metals. Each section is fabricated with the right type of edge or hook strip for the specification of screen cloth and to fit the particular make and model of screening machine on which it will be used.



Telephone HE 1-5400 • Teletype CV 586

THE W. S. TYLER COMPANY
CLEVELAND 14, OHIO
Manufacturers of Woven Wire Screens and Screening Machinery

Enter 1037 on Reader Card



600-CFM GYRO-FLO COMPRESSOR — Hooked-up behind the boom cat, this husky rotary unit provides a completely self-contained air power plant with ample capacity for operating the two heavy-duty drills. It can go anywhere, and stands up under the most severe temperature and climatic conditions.



I-R DUAL-DRILL RIG — Mounted on a sturdy steel frame suspended from the tractor boom, this dual rig drills two accurately-spaced holes at a time. Powerful driller-type drills with air-powered feed and retraction make short work of pipe-line drilling. Single manifold connection, built-in air line lubricators and simple, centralized controls are designed specifically for this type of work.

This I-R Combination pays off on FOUR CORNERS PIPE LINE

When A. P. Vaughn Contractors started work on Section 1 of the Four Corners Pipe Line—a 76 mile spread of 16-inch line from Aneth Field in Southern Utah to Kayenta, Arizona—they knew the going would be rough on men and equipment. The area is hot, dry and dusty. And operations would be carried on more than 100 miles from the nearest field office. Drilling equipment would have to stand up, day after day under a boiling sun and hot, wind-blown sand.

So they assigned their top teams to the job — Ingersoll-Rand Gyro-Flo portable compressors and PLM Dual Drill Rigs. With this equipment drilling 4-foot holes, two at a time, the line has been advanced at the rate of about a mile a day.

Whenever dependability and performance are vital, this I-R pipe-line combination means maximum economy and minimum down-time for maintenance. For further details, get in touch with your Ingersoll-Rand representative today.

Ingersoll-Rand
14-725

11 Broadway, New York 4, N. Y.



AN UNBEATABLE COMBINATION...GYRO-FLO COMPRESSORS AND I-R ROCK DRILLS

Enter 1016 on Reader Card

ROCKY'S NOTES

(Continued from page 139)

two dissenting Justices to help them, for the dissenters raised the possibility that these decisions may assure that the consequences of engaging in unfair labor practice will vary from state to state, which would be inconsistent with the purposes of the Taft-Hartley labor relations law. They also raised the point that under these decisions employers might also be liable to their employees for damages in lockouts.

Thus, the shoe may conceivably fit the foot of either party, and neither one should rejoice or condemn the decisions as a partisan issue. If the decision had been otherwise than a triumph for our state courts of civil law, all of us, union members and management, would have witnessed the passing of what few remain of our "absolute rights." In that case it would not make a whole lot of difference whether we were forcibly taken over by the Communists or not, for we would have been well on the way to a communist, Godless society, without any outside suggestions or assistance—for we would have ceased to recognize and uphold the God-given rights, which our ancestors so firmly believed in. To defend them they pledged "their lives, their fortunes and their sacred honor."

It is to be hoped that neither our legislatures nor our courts ever concede that such rights must be sacrificed entirely for any conceivable good to society. It would be difficult to imagine our public acceptance of such a society unless we as citizens become completely indifferent to the trends all about us. The faith in God and consequently in God-given rights to human beings, because they are human, exhibited by the founders of our Nation needs to be recalled once in a while at least; and the old-fashioned practice of having the Declaration of Independence read at Fourth of July celebrations by leading local politicians is something that could well be restored.

END

Lightweight aggregate plant will open soon

BRITISH COLUMBIA LIGHTWEIGHT AGGREGATES LTD., a new company formed by a group of Vancouver businessmen for the purpose of manufacturing lightweight aggregate from shale, expects to be in production this year. The material will be mined and processed on Saturna Island, southernmost of the Gulf Islands lying between Vancouver and Victoria.

Diamond INDUSTRIAL TELEVISION for the **TOUGH JOBS**



Diamond "Utiliscope" has extremely long life


Here is a rugged and durable television system built especially for industrial use. It gives years of satisfactory service under the most difficult conditions industry has to offer . . . and with minimum attention. Diamond television systems installed as long ago as 1947 are still in operation.

Have you explored the possibilities of the Diamond "Utiliscope" for your remote viewing problems? It is saving money and improving operations in many plants. The coupon below will bring full information.

REPRESENTATIVE APPLICATIONS

- Boiler Furnace Interiors
-
- Annealing Furnace Interiors
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- Steel Billet Pouring
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- Open Hearth Furnace Interiors
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- Cement Kiln Interiors
-
- Remote Mining Machinery
-
- Slab Furnace Interiors

8120



**FIRST IN
INDUSTRIAL
TELEVISION**

SINCE 1946, DIAMOND
HAS MANUFACTURED
QUALITY TELEVISION
FOR INDUSTRY

DIAMOND POWER SPECIALTY CORP.
ELECTRONICS DIVISION, P.O. BOX 58CC
LANCASTER, OHIO

Please send me without obligation a copy of bulletin showing how Diamond Industrial Television will help me reduce costs and improve operations.

Name

Title

Company

Address

Enter 1038 on Reader Card

FLEXIBLE, 2-BEARING IDLER

**cuts belt conveyor
maintenance 90%**



Still on the go after 5¼ "no-down-time" years handling abrasive foundry sand, with a 90% reduction in idler maintenance—that is the record of a unique belt conveyor idler, the Joy *Limberoller*.

Other installations include successful handling of sticky, corrosive triple super-phosphate and fertilizers, potash, wet concrete mix, hot coke, coal, sticky iron ores, trap rock, with up to *twenty-one times* the service life of former idlers on the same jobs.

Resilient discs on a flexible steel cable, the Joy *Limberoller* has only 2 bearings, up out of the dirt. It conforms to the load, cushions and guides belt; needs no lubrication. It resists dust, abrasion, corrosion and material buildup—thus avoids fouled bearings; minimizes chemical and mechanical wear.

The *Limberoller* weighs $\frac{2}{3}$ less than a conventional steel idler; is locked by a simple cotter key into special lightweight stands for easy installation and removal. No cover sheets are needed. Two types of stands are available: one that bolts to conventional rigid sections; and a self-supporting type that forms its own easily-erected portable sections without bolts, by using special stiffening rails.

Because of these unique features, many companies have adopted *Limberollers* as standard for all belt conveyor operations. *Limberollers* are available for belt widths of 18" —42". Details from *Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.* In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ont.* Bulletin 61-27.

Enter 1060 on Reader Card

NEW LITERATURE

Dust collectors

THE DUCON Co. has made available Bulletin A-9157 describing and illustrating its line of wet and dry type dust collectors and auxiliary equipment, including cyclones, centrifugal and dynamic washers, dust and fiber filters. Also covered are the Type C two-door discharge gate and Type FA trickle valve.

Enter 500 on Reader Card

Rotary air drill

DAVEY COMPRESSOR Co. has issued Bulletin E-702S-2 describing its Model M-8A rotary air drill, recommended for core, shot and blast-hole drilling. Specifications are provided along with a listing of each equipment item included in the drill unit.

Enter 501 on Reader Card

Blending system

FULLER Co. has made available Bulletin B-2 describing its Airmerge system for the blending of dry pulverized materials. Eight illustrated sections discuss the complete operation, showing how materials are homogenized by combining quadrant blending and pulsated aeration. It is said that the system can be used in either a batch or continuous operation.

Enter 502 on Reader Card

Woven screens

MANGANESE STEEL FORGE Co. has brought out a catalog describing its Rol-Man flat-lock manganese steel screens. Screen specifications are discussed as well as special constructions and ordering information. In addition, special sections are devoted to draw plates and skirt boards.

Enter 503 on Reader Card

Geared coupling

LINK-BELT Co. has made available Folder 2875 describing its MC geared coupling designed especially for use as a motor coupling. Also covered is the use of spiral cam-locking fasteners which join the cover flanges.

Enter 504 on Reader Card

Insulation

EHRET MAGNESIA MFG. Co. is distributing Catalog 12C describing its line of insulation for indoor or out-

door applications for such equipment as furnaces, boilers, evaporators, heat exchangers, kilns and turbines. Physical properties, forms and thermal conductivity data are listed for Therma-lite 85 percent magnesia and Therma-sil calcium silicate insulation.

Enter 505 on Reader Card

Rear axles

INTERNATIONAL HARVESTER Co. has prepared Form CR-320-H describing its line of single reduction and two-speed truck-built, heavy-duty rear axles. Features of the single-reduction axle are pointed out in a cross-sectional view.

Enter 506 on Reader Card

Slings and fittings

UNION WIRE ROPE CORP. has released a fully illustrated 40-page reference book that covers more than 80 subjects on Tuffy slings and fittings. Included in the new edition is new reference information, condensed into handy chart form, on sling types, dimensions and rated loads. In addition, the section of Tuffy sling fittings has been expanded to cover many fittings not previously shown.

Enter 507 on Reader Card

Feeders

DENVER EQUIPMENT Co. has prepared Bulletin F6-B9 featuring its Model 12-A wet reagent feeders and cone type dry feeders. Construction and design characteristics are discussed as well as dimensions and capacities.

Enter 508 on Reader Card

Dragline buckets

ELECTRIC STEEL FOUNDRY Co. has published Bulletin 188C describing its line of dragline and triple tapered design dragline buckets. A section containing on-the-job photos features a 29-cu. yd. bucket built to customer specifications.

Enter 509 on Reader Card

Vibrating screens

SYNTRON Co. has issued a catalog describing its line of vibrating screens, including pulsating-magnet, concentric action, unbalanced pulley and grizzly bar screens and screening feeders. Data and specifications are presented.

Enter 510 on Reader Card

(Continued on page 145)



THE Toughness Champ CAN TAKE IT

OUR CLUPAK* MULTIWALLS

These new multiwalls can take punishment that knocks out—actually breaks—ordinary multiwalls.

Our new bags are made with Kraftman Clupak paper that's much tougher because of a patented, built-in "stretch." You can maul these new bags—store, transport, use them with a roughness that wrecks old-fashioned multiwalls.

And these new bags *cost no more* than the old ones!

Our Clupak multiwalls are available now in these types: Pasted Open Mouth, Pasted Valve, Sewn Valve, Sewn Open Mouth and Stepped End.

All of them are lighter and tougher. Try them . . . on your next carload order, let us include a trial shipment of 5,000 of our Clupak multiwalls. Call or write:

MULTIWALL BAG DIVISION

WEST VIRGINIA PULP AND PAPER COMPANY

230 Park Avenue, New York 17, N. Y.

PLANTS: TORRANCE, CALIF. • ST. LOUIS, MO. • NEW ORLEANS, LA. • MOBILE, ALA. • WELLSBURG, W. VA.

*Clupak, Inc.'s trademark for stretchable paper.



Enter 1150 on Reader Card

ROCK PRODUCTS, August, 1958

143



HERRINGBONE

WIRE ROPE

New
Longer-Wearing
Pattern in
Wire Rope
Styles!

After three years of extensive field trials this, the newest of Roebling's wire ropes, is now ready to go to work for you on a service basis that will exceed that of *the wire rope you are now using*.

Roebling Herringbone* combines the best features of both regular and Lang lay rope constructions; being made up of two pairs of Lang lay strands and two strands of regular lay. The regular lay strands separate the two pairs of Lang lay strands. Thus, in one rope you have the superior flexibility and abrasion resistance of Lang lay and the greater structural stability of regular lay.

For the past three years, under all kinds of conditions, Herringbone has been used for general hoisting, holding and closing lines, shovel ropes, wagon scraper ropes and dragline ropes. The results have been wonderful . . . excellent flexibility, exceptional resistance to shock and abrasion, smooth, easy operation around drums and over sheaves, smooth spooling properties and structural stability unequalled by other rope for the same job.

There has never been a better time—or a wider need—for a wire rope that returns so much service for its cost. And, in addition to being a top performer on the job, Herringbone eliminates the necessity of stocking Lang lay for one purpose and regular lay for another.

You are invited to get in touch with your Roebling distributor or write Wire Rope Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey, for further and fuller details on the *investment* qualities of this new and highly serviceable rope.

*Reg. appl. for

ROEBLING

Branch Offices in Principal Cities • Subsidiary of The Colorado Fuel and Iron Corporation



Enter 1017 on Reader Card

NEW LITERATURE

(Continued from page 142)

Screw pump

GOODYEAR PUMPS LTD. has described its newly designed, continuous self-priming and self-lubricating pump in a recently issued bulletin. Available in 1¼, 1½ and 2½-in. sizes, the pump is suitable for direct coupling or V-belt drive by electric, diesel or compressed air motor.

Enter 511 on Reader Card

Rake thickeners

DENVER EQUIPMENT Co. has issued Bulletin T5-B6 covering its line of spiral rake thickeners ranging in sizes from 3 to 150 ft. diam. Features including gear construction, mechanism enclosure, overload indicator, rake lifting device and thickener drive are described and illustrated.

Enter 512 on Reader Card

Welding equipment

TWECO PRODUCTS, INC. has prepared Catalog 11 illustrating and describing its line of arc welding cable connections and accessories. Products covered include electrode holders, clamps, cable connectors, jacket grippers, cable splicers and connectors.

Enter 513 on Reader Card

Immersible motor

THE LOUIS ALLIS Co. has released Bulletin 2300 describing its immersible motor available in ratings from ¾ to 40 hp. polyphase and ¾ to 5 hp. single phase. Applications are discussed in which unit is close-coupled to pumps, agitators and mixers.

Enter 514 on Reader Card

Tractor scrapers

CLARK EQUIPMENT Co. has made available a catalog covering its Michigan Models 110, 210 and 310 tractor scrapers. Design and operating features covered include scraper bowl, interchangeable wheels, power-shift transmission, torque converter drive, planetary wheel axles and servicing accessibility.

Enter 515 on Reader Card

Drill bits

LE ROI DIV., WESTINGHOUSE AIR BRAKE Co., has published Bulletin RD29 describing its line of one-use rock drill bits.

Enter 516 on Reader Card
END

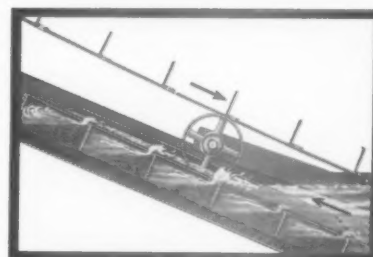


CLEANER SANDS ... more efficient de-sliming ...with the "OVERDRAIN" Classifier

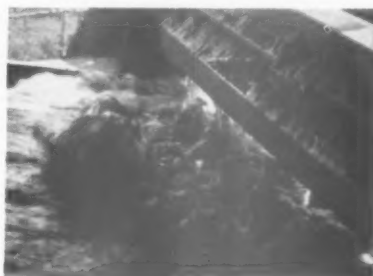
The "Overdrain" Classifier is a completely new device in the field of mechanical wet classifiers. The belt, with lifting flights attached beneath, moves upwardly out of the sand bed between two stationary side shrouds—creating the effect of a series of moving, closed, washing compartments.

The only outlet from these compartments is via holes in the belt above. Surplus liquid and slimes discharge through these "overdrain" holes without mixing with the oncoming sands. The end result is an extremely clean sand discharge, excellent de-sliming—making the "Overdrain" Classifier an ideal washing device.

Write for
Hardinge Catalog 39-C—7



Section through "Overdrain" Classifier showing upward-moving, closed, washing compartments.



Unretouched photograph of "Overdrain" action above the belt—water and slimes discharging upwardly.

HARDINGE

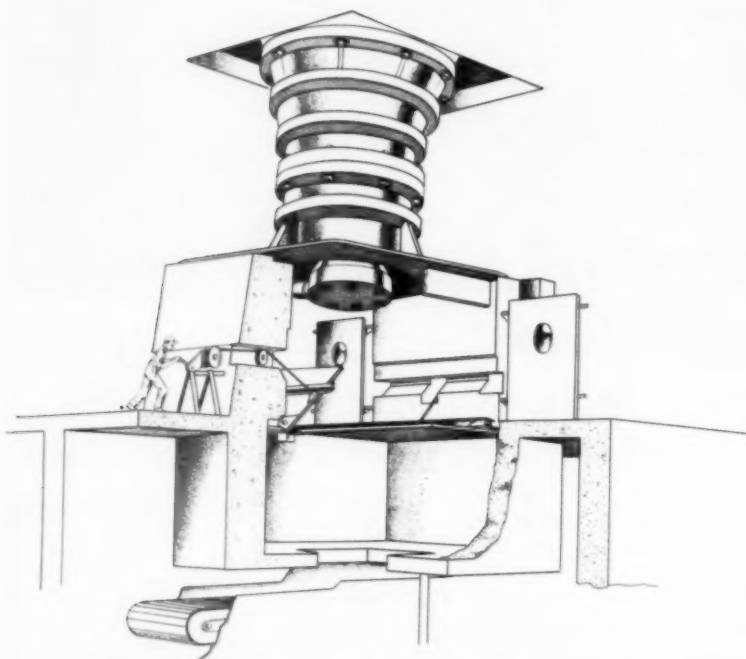
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 ARCH ST. • Main Office and Works
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Enter 1061 on Reader Card

ROCK PRODUCTS, August, 1958

NEW

MACHINERY



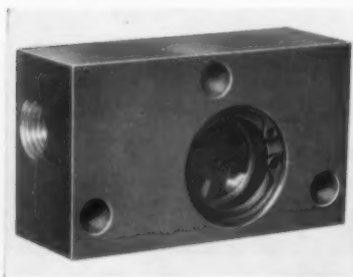
Crusher foundation has retractable working platform

AN IMPROVED FOUNDATION utilizing a retractable working platform has been developed to expedite gyratory crusher maintenance. Designed for use with bottom discharge crushers 30 x 55 in. or larger, the platform consists of two hinged floor sections that can be pulled up by service crane or hand operated winch to fit the inside wall of the foundation. (Cross section view shows one of the sections being raised by means of a hand winch.) With the platform in this position, a large open area is provided between the bottom of the crusher and the discharge conveyor for storage space.

When the platform is up, the steel-lined undersides of the floor sections protect the foundation by taking the abrasive wear of the crushed material. The rails which accommodate the eccentric cart or other service cart are also protected from abrasive wear, as they are drawn up with the door and into the foundation bolt pockets. The layout is applicable to new plants, expansions or modernizations. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 100 on Reader Card

Visual indicator saves filters, repairs

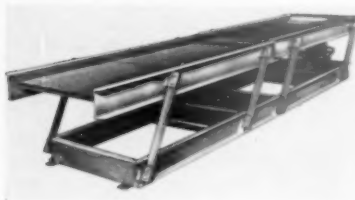


A VISUAL INDICATOR saves filters and repairs by showing the condition of the filter elements in an oil hydraulic system. The unit shows the operator at a glance when an oil filter is dirty and nonfunctioning. A spinner, mounted in the indicator wall, revolves when the filter element is clogged. The indicator is also used to show pressure drops across other hydraulic circuit components.

The indicator is connected in parallel with any size line filter. Only small standard fittings and piping are needed. The unit operates in any position and need not be located at the filter. *Schroeder Brothers Corp., McKees Rocks, Pa.*

Enter 101 on Reader Card

Shaker screen



THIS NEW SHAKER SCREEN is designed for scalping and sizing of heavy bulk materials. A variety of screen surfaces—woven wire cloth, wedge slot, flange lip or perforated plate—can be fitted into the screen box of either or both sections. The shaker screen will accomplish a number of gradations depending on the material being handled and the length of the vibrating section. It is adaptable to some dewatering processes. *Syntron Co., 450 Lexington Ave., Homer City, Pa.*

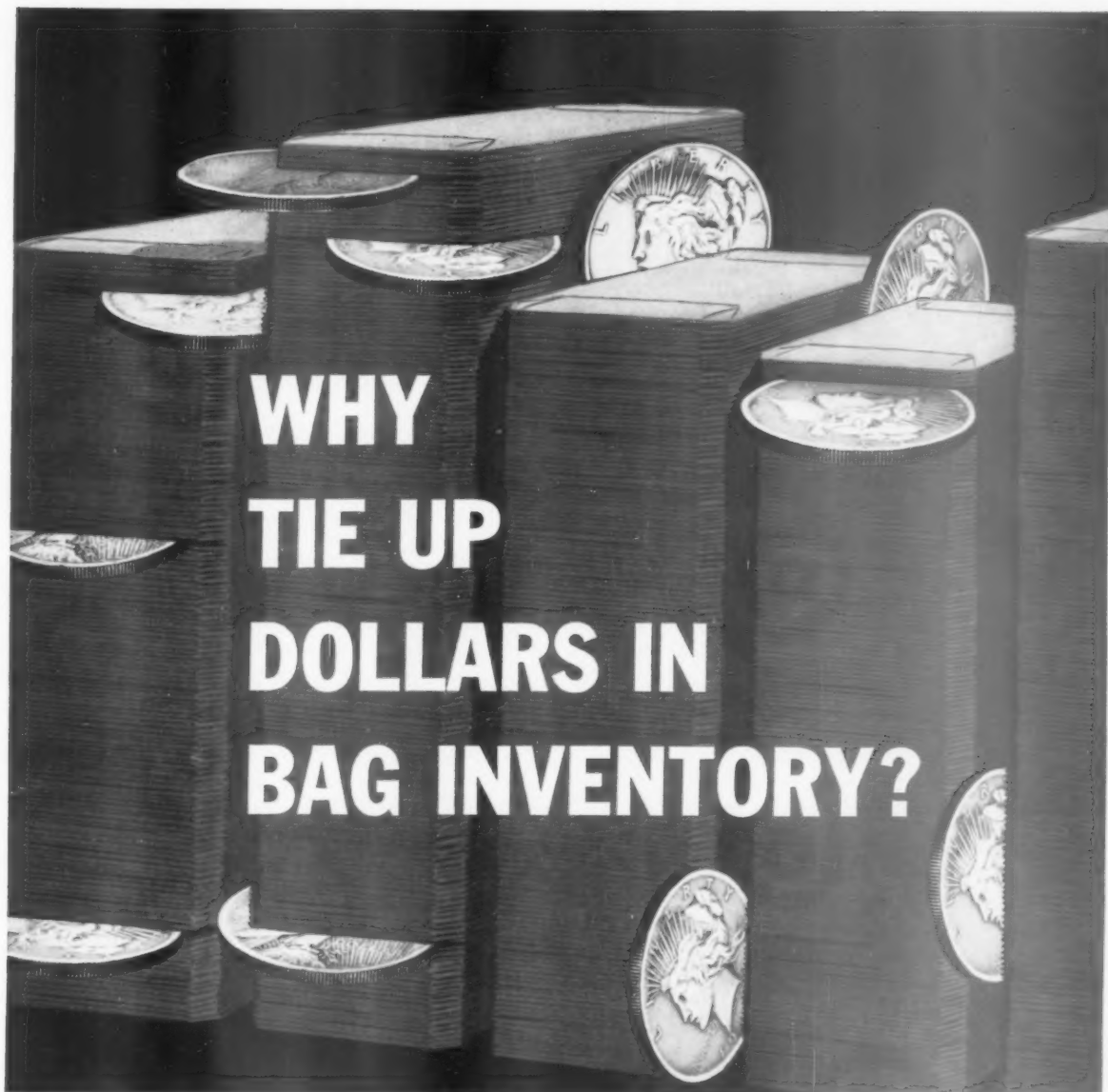
Enter 102 on Reader Card

Belt conveyors

MODEL 375 "TRANSFER CONVEYORS" are now available in 18, 24 and 30-in. belt widths and in lengths ranging from 9 to 102 ft., in 1-ft. increments. These belt conveyors are pre-engineered and prefabricated, designed for immediate job installation.

They are equipped with ball-bearing, anti-friction carriers and return rolls. Each conveyor head end incorporates a drive and provides an adjustment for length of the unit. Each tail end provides additional adjustment for belt tension through Acme thread screws and is equipped with a built-in loading hopper. Intermediate sections are of channel frame construction with heavy decking. *Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.*

Enter 103 on Reader Card



WHY TIE UP DOLLARS IN BAG INVENTORY?

Doing business with St. Regis cuts down on inventory!

What's the secret? Our plants are strategically located with modern equipment for manufacturing all types of cement bags. Your order is processed immediately. Top quality *guaranteed* always. For less inventory, more capital, and service fast enough to meet your most urgent needs . . . call your St. Regis Multiwall representative *today!*

MULTIWALL PACKAGING DIVISION

St. Regis 
PAPER COMPANY

150 EAST 42ND STREET, NEW YORK 17, N. Y.

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ST. REGIS PLANTS READY TO SERVE YOU — NAZARETH, PENNSYLVANIA • FRANKLIN, VIRGINIA • PENSACOLA, FLORIDA
LOS ANGELES, CALIFORNIA • SAN LEANDRO, CALIFORNIA • TACOMA, WASHINGTON • KANSAS CITY, MISSOURI • TOLEDO, OHIO

Enter 1142 on Reader Card

ROCK PRODUCTS, August, 1958

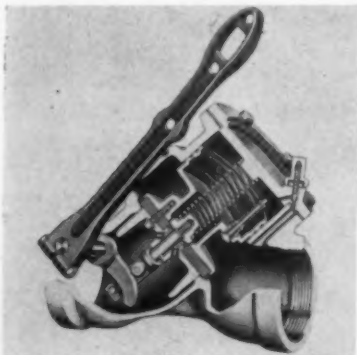
147

NEW MACHINERY

(Continued from page 146)

Slow-closing valves

NONSHOCK, SLOW-CLOSING LOADING VALVES are now available in 125-psi. bronze and aluminum, sizes 2 in. through 6 in., flanged and screwed end models. These valves are specifically designed to prevent piping system damage caused by too-fast shut-off of flow. They eliminate the need for surge chambers. Initial loading valve closure movement is fast, preventing



overflow and wastage, and final closure is gradual, preventing line shock. Closing speed is easily adjusted in the field. *Jordan Industrial Sales Division of OPW Corp., 6013 Wiehe Road, Cincinnati 13, Ohio.*

Enter 104 on Reader Card

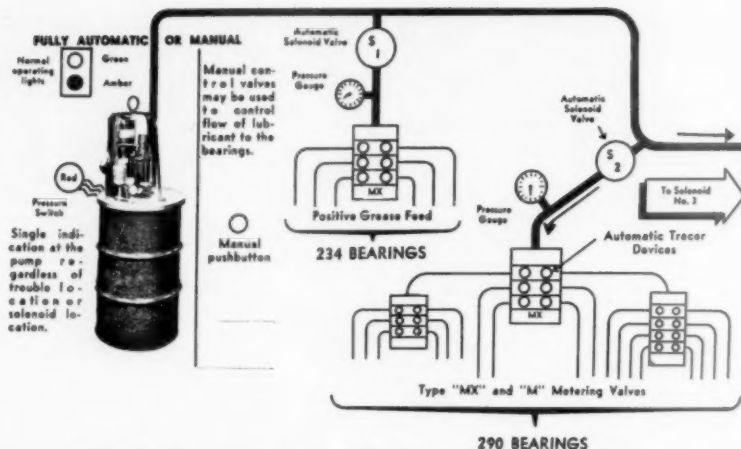
Double tandem crane carriers handle heavy loads



TWO SERIES of double tandem 8 x 4 and 8 x 6 rubber-tired crane carriers have been introduced. The carriers, designed for the heavy-duty operations of 25 to 45-ton cranes, provide easy handling of greater load capacity by distributing the extra weight over two axles in front and two in the rear.

The new 8 x 4 rubber-tired carriers are equipped with driving power to both axles of the rear tandem. The 8 x 6 models are designed with a driving rear tandem plus a driving front axle on the front tandem, providing six-wheel drive. *Four Wheel Drive Auto Co., Clintonville, Wis.*

Enter 105 on Reader Card



SINGLE "MULTIZONE" LINE UNDER PRESSURE — UP TO 500' IN LENGTH

Automatic lubrication system for cement plants

AN INTERMITTENT MULTIZONE lubrication system that enables a great number of bearings distributed over a large area to be lubricated from one or more central stations has been announced. The system is said to be ideal for cement plants, sintering plants and other applications where bearings are inaccessible and proper lubrication is a problem.

An automatic or electric barrel pump with timing controls acts as the lubricant reservoir for the system. There is a single indication at the central station and at each individual zone that all bearings have been satis-

factorily lubricated. (Each zone can provide for 50 to 100 bearings.) According to the manufacturer, the single indication feature is positive assurance that all bearings receive the lubricant they need. The new development is a single-line system which may be up to 500 ft. or more in length. Metering valves dispense the amount of lubricant needed by the bearings. *Trabon Engineering Corp., 28821 Aurora Rd., Solon, Ohio.*

Enter 106 on Reader Card

Portable air compressor

WHAT IS DESCRIBED AS the largest portable rotary air compressor manufactured to date is now available. The new 1200RD2 is a twin unit rated at 1,200 cfm. of free air compressed to 100 psi. The large-capacity compressor can provide power for large-hole quarry drilling or stand-by plant air.

The twin-unit design of two-stage, oil-cooled, sliding vane type compressors, powered by two GM 6-71 diesel engines, provides flexibility of cfm. output. The new model is mounted on a unit welded steel frame and four 7.50 x 20, 10-ply tires. Dry weight is 14,700 lb. Length is 14½ ft.; height, to top of hood, is 8 ft.; width is 7 ft. 11 in. Turning radius is 18 ft.

The new model operates at rated output speeds of 1,800 rpm. for the compressors and 2,000 rpm. for the engines. The compressors are coupled to the engines with hydraulically actuated clutches. Each unit has a 100-percent capacity control which matches air supply to air demands within a pressure range of 10 psi. One combination air receiver-oil separator is used. *Le Roi Division, Westinghouse Air Brake Co., Milwaukee 1, Wis.*

Enter 107 on Reader Card

(Continued on page 150)

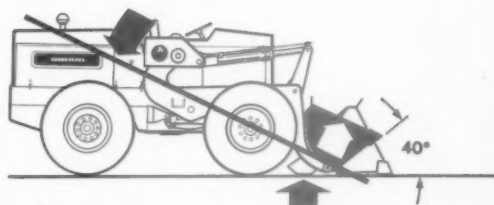
"Outperforms any loader in its size class..."



"Our new HO 'PAYLOADER' is an operator's machine," says L. J. Atkins, . . . "it handles easily, has good brakes, plenty of power and excellent balance. It will outperform any loader in its size class!"

Tractor-shovel performance like that is mighty important to an aggregate producer like T. J. Atkins and Company, of Jefferson, Indiana. Their machine is in constant use throughout the plant, loading out materials, general maintenance and stockpile care. It travels from job to job at speeds up to 24 mph. After a full years use, Mr. Atkins also reports: "Our 'PAYLOADER' has practically retired the four conveyor-type loaders previously used. It is nearly twice as fast working from the pile . . . it goes in fast and smooth and brings out heaped loads without excessive spillage."

Operators and owners alike recognize the superior digging power of 4-wheel-drive "PAYLOADER" tractor-shovels. Because these models are equipped with such outstanding performance features as hydraulic load shock absorber, power-transfer differentials, "no-stop" power-shift transmission, planetary final drives, power-steering and 4-wheel power brakes, they outperform any wheeled tractor-shovel of comparable size. There is a "PAYLOADER" Distributor near you that is ready to prove this performance *on your work!* Why not call him today for a demonstration.



Here's why a "PAYLOADER" outproduces any unit of comparable size — A tremendous pry-out force, almost equal to the weight of the machine, can be exerted at bucket digging edge by using the break-out pads on the bottom of the lifting arms as a ground support or fulcrum. Pads transfer load stresses to the ground, not the front axle.

THE FRANK G. HOUGH CO.

705 Sunnyside Ave., Libertyville, Ill.

Send more data on 4-wheel-drive "PAYLOADER" tractor-shovels as checked:

- ☐ HO - 9,000 lb. Carry Cap. (1 to 4 cu. yd. buckets)
- ☐ HH - 7,000 lb. Carry Cap. (1 1/2 to 3 1/4 cu. yd. buckets)
- ☐ HU - 5,000 lb. Carry Cap. (1 1/2 to 2 1/2 cu. yd. buckets)

Name.....

Title.....

Company.....

Street.....

City..... State.....

12-B-5



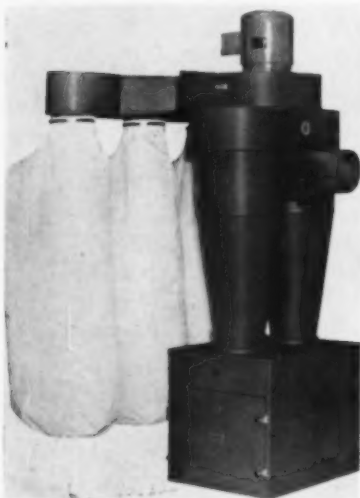
PAYLOADER®

MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



NEW MACHINERY

(Continued from page 148)



Dust collectors

TORIT MFG. CO. has announced conversion of its line of cyclone separator-type dust collectors to radial fans. The fan change will give increased performance on all models because the radial wheels move more cfm. of air and operate efficiently against higher resistances.

These cyclone separator models may be used where large volumes of dust must be collected. In operation, dust-laden air is drawn into the collector, where spiral baffles direct it into a whirlwind motion. Dust particles are precipitated out of the air stream by centrifugal force and settle into the dust reservoir below. *Torit Mfg. Co., 287 Walnut St., St. Paul, Minnesota.*

Enter 109 on Reader Card

Mobile hoppers sized to needs of the plant



A LINE OF MOBILE HOPPERS mounted on structural beam chassis frames has been announced. Pictured here is a 10-cu. yd. hopper, 8 ft. square, feeding onto a belt conveyor with a discharge height of 9 ft. Overall height of unit is 10 ft. 9 in.; width is 8 ft. and length, 27 ft. Length of truck frame is 17 ft. Other sizes of hopper units are available to suit individual needs. *Lippmann Engineering Works, Inc., 4603 W. Mitchell St., Milwaukee 14, Wis.*

Enter 108 on Reader Card

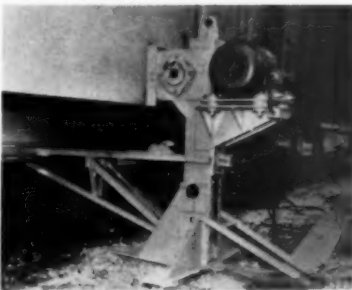
Heavy-walled plastic bags

A CHEMICAL COMPANY has developed a heavy-walled polyethylene bag for use as a shipping container, and has test-shipped 500,000 lb. of polyethylene resin in these plastic bags. To make possible the use of the bag in production-line filling equipment, the company worked out a more positive friction grip to hold the bag and cut down on the "pillowing" effect of trapped air. Tests passed by the new bag included a 4-ft. drop off the back of a truck going 30 mph. In actual test shipments, the bags marked up a .45 of 1 percent breakage record.

Possible applications of the new bag include materials that need a bag that is moistureproof but permeable to oxygen and carbon dioxide, present a corrosion problem and could benefit from a see-through package. *Spencer Chemical Co., 1004 Baltimore, Kansas City, Missouri.*

Enter 110 on Reader Card

Car shaker



AN IMPROVED SHAKER that increases the effective vibration transmitted to covered-hopper cars has been announced. The unit consists of the manufacturer's regular shaker, on which an outrigger has been rigidly welded

for contacting the main frame of the car. A standard tension bar is used.

The shaker column sits loosely in a boot wide enough to provide a firm footing. The extreme end of the outrigger is placed between the existing brake rod and the bottom of the main beam. A tight wedging effect is said to be created between the car and the ground, transmitting a large part of the vibration to the car.

The shaker operates at 1,750 rpm. through a 3 V-belt drive. A 5-hp. motor, at 220, 440 or 550 v., is used. The shaker weighs about 1,500 lb. *National Conveyor & Supply Co., 356 N. Harding Ave., Chicago 29, Ill.*

Enter 111 on Reader Card

Nylon truck tire

A TRUCK TIRE made with all-nylon cord has been announced for over-the-road service. Named the "All-Nylon Heavy Duty Express" and made in tubeless and tube-type, the tire is available in 13 sizes, ranging from 6.70-15 to 10.00-22. The number of plies ranges from six to twelve, depending on the size of the tire.

The "Flex-Rite" nylon cord body withstands double the impact of ordinary cord materials and resists heat blowouts and flex breaks, says the manufacturer. As a result, the tire can be retreaded over and over. Two chafing strips reinforce the lower sidewalls of the tire. *The B. F. Goodrich Co., Akron, Ohio.*

Enter 112 on Reader Card

Telescopic hoists

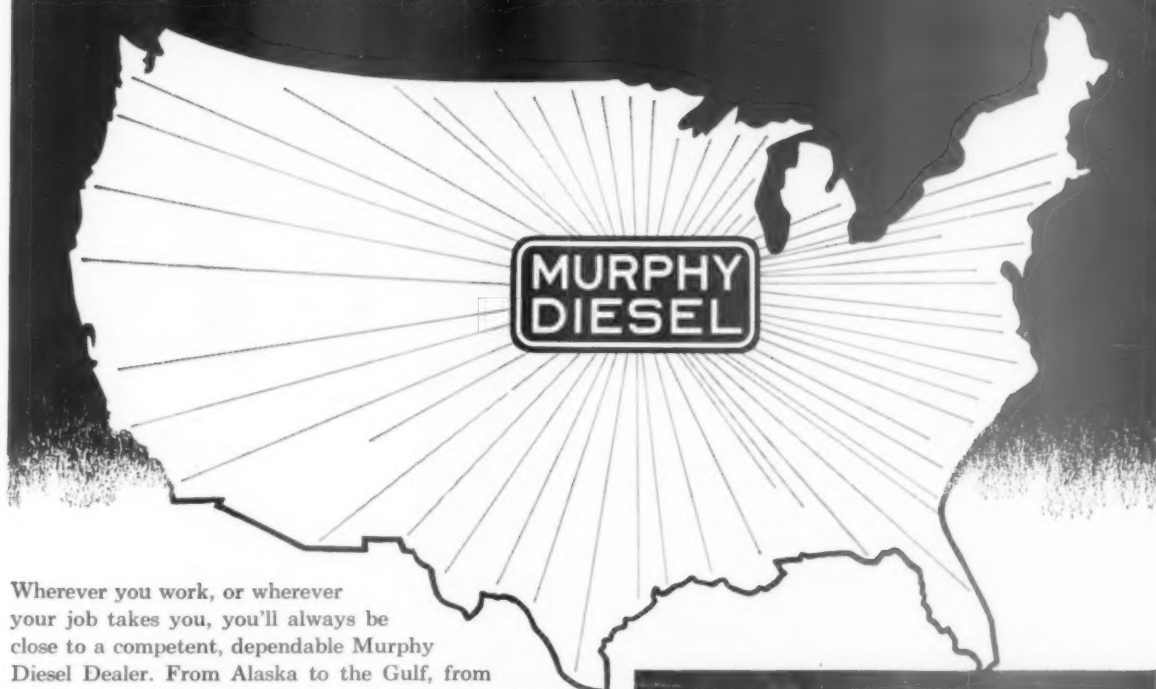


TELESCOPIC HOISTS for frameless dump trucks are now being manufactured. A rugged telescopic cylinder obtains column strength from long bearing overlap and the use of heavy wall seamless steel tubing. The hoists are required to help stabilize the load as well as to lift. Rodpak metallic packing is used. Wiper rings keep foreign matter from entering the hydraulic system. *Remco Mfg. Co., Willits, California.*

Enter 113 on Reader Card

(Continued on page 152)

To save you time and money—
the MURPHY DIESEL DEALER in your area
specializes in prompt quality service



Wherever you work, or wherever your job takes you, you'll always be close to a competent, dependable Murphy Diesel Dealer. From Alaska to the Gulf, from Pacific to Atlantic, the continent-wide network of Murphy Diesel Dealers is ready to give you specialized service *promptly* . . . a ready, nearby source for genuine Murphy Diesel replacement parts with precision-built quality to insure accurate fit and trouble-free service . . . and factory-trained service men with the tools and skill to keep your Murphy Diesel in peak operating condition.

Your Murphy Diesel Dealer will analyze your power needs for the size and type of engines or generator sets to meet your requirements. Get acquainted with the Murphy Diesel Dealer in your locality now. Make it a point to see him when you have any kind of service or power problem.

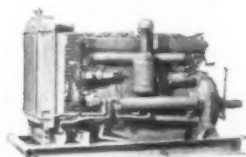
MURPHY DIESEL COMPANY

5315 W. Burnham St. Milwaukee 14, Wis.

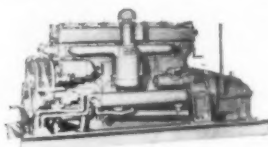
THERE'S A SIZE AND TYPE OF MURPHY DIESEL FOR YOUR POWER REQUIREMENTS



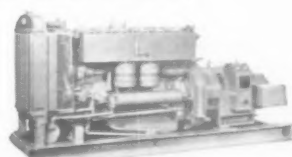
Service men of Murphy Diesel Dealers attend factory training schools regularly to learn all phases of operation, preventive maintenance and servicing of Murphy Diesel Engines.



INDUSTRIAL ENGINES AND POWER UNITS
 96 to 265 HP. Mech-Elec Units available for mechanical and electric power separately or simultaneously.



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 Marine propulsion engines, 96 to 243 HP; Auxiliaries, 64 to 165 KW.



GENERATOR SETS
 For marine, industrial and construction use, 64 to 165 KW. Welding Power sets 64 to 150 KW. »

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storage...

is this your wire rope problem?



**Avoid deterioration while equipment is idle.
Red-Strand Bulletin No. 103 tells how.**

Costly damage can be the penalty for improper outdoor storage of wire rope especially in winter. Several months of exposure can corrode rope so severely that breaking-strength is dangerously reduced with a loss much greater than the cost of adequate protection. How best to provide that protection is clearly explained in special Service Bulletin No. 103. This is one of a series, devised to help wire rope users get better performance without greater cost. Copies of bulletins are sent free on request. Write H. K. Porter Company, Inc.—Leschen Wire Rope Division, St. Louis 12, Mo.



H. K. PORTER COMPANY, INC.
LESCHEN WIRE ROPE DIVISION

Enter 1032 on Reader Card

NEW MACHINERY

(Continued from page 150)



Safety device

A DEVICE TO MINIMIZE the number of fatalities and serious accidents on cranes and shovels has been introduced. Called the Safety Circle, the product consists of a semicircular steel-mesh platform attached to each side of the cab. The platform hinges upward and locks in position whenever it is necessary to move the equipment any distance.

The circle inscribed by the perimeter of the device practically eliminates the possibility of a worker's being in the death-zone, the manufacturer says. The device is also said to provide an easy-access platform that greatly increases the field of vision on a job. Initial tests were made in the sand and gravel field. *Answers, Inc., 1215 Oak St., Eugene, Ore.*

Enter 133 on Reader Card

Multiple swivel nozzle

A PNEUMATIC ATOMIZING NOZZLE for simultaneous spraying in two or more directions is said to provide a compact, simplified method to meet multiple-position spraying needs in a wide variety of industrial applications.

The nozzle can be supplied with two, three or four heads, each adjustable to any position in a 360-deg. range. The nozzle unit measures 1 1/4 x 2 in. at maximum cross-section and 4 13/32 in. in overall height with two swivel heads. Additional swivel heads each add 1 3/32 in. to the height. Nozzles are supplied standard in brass and are also available in stainless steel. *Spraying Systems Co., 3285 Randolph St., Bellwood, Ill.*

Enter 134 on Reader Card

(Continued on opposite page)

NEW MACHINERY

(Continued from opposite page)

Percussive drills

THREE NEW PERCUSSIVE DRILLS have been developed for medium and deep-hole operations. In hard trap rock the 4½-in. heavy-duty CP-450-DR model, mounted on a G-800 Trac-drill, drills 10 ft. of 3-in. hole every 7 min. Using 10-ft. sectional rods on 40-ft. holes, total elapsed drilling time is said to be only 34 min. It handles 3-in. holes to 75 ft., or larger holes to lesser depths.

Both the heavier-duty CP-450DR and the 4-in. CP-400DR models have standard-neutral-reverse-rotation, and the machined alloy-steel striking bar in the locked-in-shank chuck assembly is threaded for sectional steel. Powerful air-blow cleans drill cuttings at rated depths. The CP-400DR drills 2½-in. holes to 50 ft. or larger holes to lesser depths.

For medium operations the new 4-in. standard-rotation CP-400 drills 3-in. holes to 25 ft. Easily renewable cylinder sleeve cuts maintenance costs on both models and a semi-locking chuck on the CP-400 prevents "spitting" during drill steel retraction. *Chicago Pneumatic Tool Co., 6 East 44th St., New York 17, N.Y.*

Enter 135 on Reader Card

Rock ripper



A ROCK RIPPER BLADE that will not break or bend and is adjustable to all sizes of bulldozer moldboard blades has been introduced. Known as the Aaron ripper, the unit is suited for use in rake fashion on the dozer blade for expediting scraper loadings. Also, the nonbend or breaking feature permits its use in removal of heavy rock and shales in open pit and strip mining.

Other features include easy installation and removal and lightweight construction for ease of handling. The D-9 ripper pictured was designed for extra heavy dozers with large blades. *Aaron Mfg. Co., Box 211, Okemah, Oklahoma.*

Enter 136 on Reader Card

(Continued on following page)



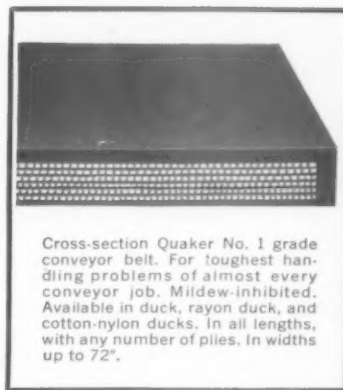
Quaker belt conveying jagged granite rock from quarry.

Here's the tough, tested belting MADE FOR THE REALLY ROUGH JOB

Take a good look at that picture. Rough, ragged, razor-sharp rock like that can take a terrific toll in conveyor belting. Or it could before Quaker came along with conveyor belting that's tough enough to take it!

Quaker Conveyor Belting is especially designed for the rough ones—jagged loads of ore, gravel, brick that would tear most belting to shreds in short order. There's a special Quaker belting for every special need, with flexibilities, degrees of puncture-resistance and tensile strength for the toughest quarry requirements. Even covers and internal-ply designs can be modified as your needs dictate.

Your Quaker industrial distributor can give you the details on Quaker Conveyor Belting, and assistance on all problems involving industrial rubber products. Call him.



Cross-section Quaker No. 1 grade conveyor belt. For toughest handling problems of almost every conveyor job. Mildew-inhibited. Available in duck, rayon duck, and cotton-nylon ducks. In all lengths, with any number of plies. In widths up to 72".



FREE CATALOG. Send for this illustrated Quaker Conveyor Belting Catalog. Write **QUAKER RUBBER DIVISION, H. K. PORTER COMPANY, INC.,** Philadelphia 24, Pa., or Pittsburg, California.

H. K. PORTER COMPANY, INC.

QUAKER RUBBER DIVISION

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ROCK PRODUCTS, August, 1958

153

FOR DEPENDABILITY
PLUS ECONOMY
REPLACE WITH
INDIAN BRAND

Get the most out of your present equipment. When you need replacements, remember we started in 1913 to build our reputation in the Manganese Steel field for dependability plus economy.

Insist on
INDIAN BRAND
MANGANESE STEEL



Shovel Dippers • Dipper Teeth
Shovel Treads
Crusher Jaw Plates
Mantles • Concaves
Bowl Liners • Roll Shells
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Carlisle, Pennsylvania • Established 1881

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TESTING
SCREEN**

SIZE-TESTS
CRUSHED
STONE
GRAVEL
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ALL ROAD AGGREGATES



Makes 2 to 7 separations simultaneously in five minutes or less per complete test. Size range: 4-inch to 200 mesh. Sand Attachment optional for handling 8-inch sieves.

**Write for catalog
describing Gilson Improvements
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The Gilson Testing Screen is the
Standard Sizing Control of the Industry

GILSON SCREEN CO.
MALINTA, OHIO

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NEW MACHINERY

(Continued from preceding page)



Dragline buckets

A LINE OF AUTOMATIC dragline buckets featuring greater capacity and heavy-duty steel construction has been designed specifically for the sand, gravel and quarrying fields. The bucket has a longer and higher basket that carries more payload—dotted lines on the photo show the added capacity. To utilize advantages of the design, the bucket has a shorter dump rope that throws the front of the bucket sharply back when hoisting to prevent spillage

of material. This is advantageous in underwater digging where material has a tendency to flow with the water in a line from the rear top of the basket to the lip.

Buckets in the line are made of USS "T-1" heavy-duty, abrasion-resistant steel. They are available with or without perforations, in sizes ranging from ½ cu. yd. and up. *Page Engineering Co., Clearing Post Office, Chicago 38, Ill.*

Enter 129 on Reader Card

Cable connectors

A NO. 24 NEOPRENE COVER for Sol-Con (solder connection) and Mec-Con (mechanical connection) cable connectors has been announced. Made of electrically safe, crush-proof neoprene, the cover is tapered to snug around the cable jacket to prevent snagging. The male and female covers are identical. Only one cover is needed to fit either half of both the No. 2 Sol-Con and No. 2-M and 4-M Mec-Con connectors. These connectors are still available with the standard vulcanized fiber cover. *Tweco Products Co., Wichita 1, Kan.*

Enter 130 on Reader Card

Trailer trains designed for aggregate hauling



SPECIALLY DESIGNED AND FABRICATED for a heavy-duty aggregate hauling operation, the above train is one of a fleet of twelve that features Daybrook aluminum dump bodies. Overall design, materials and load weight distribution permit them to carry 10,000 lb. more per train than previous equipment used. Dump body side walls, tail gate, understructure beams and longitudinals are made of aluminum. The body design has box-type side braces and sloping running boards. Body side sheets are formed with three V crimps for strength and rigidity.

Wiring for electrical accessories is enclosed in copper tubing; individual circuits lead from an encased electrical panel on each trailer unit. Hydraulic hoist equipment, also engineered for the specific hauling operation, includes the Daybrook Series 4D twin telescopic hoists for the truck trailer and a Series 3C telescopic hoist for the pull trailer. *Daybrook Hydraulic Division, Young Spring and Wire Corp., Bowling Green, Ohio.*

Enter 131 on Reader Card

(Continued on page 157)

PRODUCER

The Wemco Sand Preparation Machine:

*First Choice of Operators who know
there is a Difference
in Screw Classifiers*



Owners of Wemco Sand Preparation Machines, by experience, have sound reasons for choosing this machine for the *extra* tough jobs of producing specification sand:

- Matchless performance . . . geared to the job of saving the desired sand sizes.
- Trouble-free operation . . . negligible maintenance over many years.
- Lowest operating costs . . . lowest power requirements.
- Lifting device for spiral . . . freedom from shutdown or delays due to "unusual" conditions.

Get all the facts on the Wemco Sand Preparation Machine — and its profit potential for you.



Depend on
the Wemco Sand
Preparation Machine
and the skills
behind it.

W E M C O

Western Machinery Company
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To prepare new crushers for a hard life, Wasco County, Oregon, hard-faces rollers with Victor alloy rod. The rollers showed no discernible wear after crushing 3100 tons of extremely hard and abrasive basalt.

Lifesaver for new or used equipment **VICTOR** **Hardfacing Alloys**

Wasco County, Oregon, uses lots of crushed basalt. This rock crushes readily, yet is extremely hard and highly abrasive, consequently tough on rollers. So, as standard practice, Supt. Wayne Weeks hardfaces all rollers in brand new crushers, before ever they crush a single basalt rock. He reports hardfacing of new equipment prevents excessive wear of surface material, thus maintaining roller size during the work hardening period.

On this new crusher, he used 200 lbs. of Victor #0 semi-automatic wire, size 7/64", to hardface roller faces, and 50 lbs. of

tube Victorite coated for finish work around the roller edges. Longer crushing life will quickly pay for the rod.

You, too, can save money and extend the life of equipment subjected to abrasion, impact and heat. Simply make it standard practice to hardface both new and worn equipment with Victor alloy rods. Complete line of 27 different hardfacing rods assures you a right rod for every hardfacing need. Full range of sizes for both acetylene and electric AC and DC applications, either hand, automatic or semi-automatic. Order a supply from your Victor dealer TODAY.

FREE Victor Hardfacing Manual shows you right rod to use and how to apply it. Write us NOW for your copy.

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VICTOR EQUIPMENT COMPANY

42

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

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NEW MACHINERY

(Continued from page 154)



Tractor-shovel

A NEW TRACTOR-SHOVEL with six interchangeable buckets of 14, 16, 18, 20, 22 and 29-cu. ft. capacities is now available. Called the T-18, this addition to the Trojan line has an operating capacity of 2,500 lb. The manufacturer states that the new model's 4-ft. wheel base and overall length of 117 in. make it suited for working in tight areas with a minimum amount of operating space, such as railroad cars.

The tractor-shovel is powered by a 6-cyl., 230-cu. in. displacement, Model 30 Chrysler engine developing 72 hp. at 2,000 rpm. It is equipped with automatic torque transmission. The Yale & Towne Mfg. Co., Batavia, New York.

Enter 138 on Reader Card

Aluminum trucks



THE FIRST OF A FLEET of twelve all-wheel drive, bauxite-hauling trucks, with 28-cu. yd. capacity aluminum bodies, has been manufactured. These trucks will haul aluminum-producing ore in excess of 32 tons per trip. Special braking systems have been engineered to assure safe operation on all types of terrain.

The aluminum body increases the payload approximately 5½ tons per trip. The body is exhaust-heated during part of the trip to facilitate clean dumping of the sticky bauxite ore. At other times, the exhaust gases are expelled into the atmosphere by a butterfly valve arrangement controlled from inside the cab. Oshkosh Motor Truck, Inc., Oshkosh, Wis.

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END

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GAYCO CENTRIFUGAL AIR SEPARATORS

Classify practically all dry fine materials

You get:

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RANGE 60 to 400 mesh.

Timken bearings.
Choice of Standard or Heavy-Duty Models.



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MANUFACTURERS

NEWS



Spain

Cox

Munro

Morgan

Caterpillar promotes four men

THE PROMOTIONS OF four executives have been announced by H. S. Eberhard, president, Caterpillar Tractor Co., Peoria, Ill.

Gail E. Spain has been elected president of the company's foreign trade group. In his new position, Mr. Spain will administer British, Australian, Brazilian and Canadian subsidiaries, as well as Caterpillar Americas Co., Caterpillar Overseas C. A., and Caterpillar of Delaware, Inc. He will continue as a vice president of the parent company.

W. K. Cox will succeed Mr. Spain as vice president with administrative responsibility for domestic sales and sales promotion activities. Mr. Cox was sales promotion manager.

J. R. Munro has been named vice president in charge of the manufac-

turing division. Mr. Munro, who joined the company in 1918, formerly was director of manufacturing for foreign operations.

Also announced, was the appointment of L. L. Morgan to the position of sales promotion manager. Mr. Morgan has been serving as assistant manager of sales promotion since 1956.

Link-Belt Speeder Ltd. builds Canadian plant

A NEW CANADIAN COMPANY, Link-Belt Speeder Ltd., has begun construction of a plant on a 39-acre site in Woodstock, Ontario. Upon its completion in November, 1958, the company, a subsidiary of Link-Belt Speeder Corp., Cedar Rapids, Iowa, will manufacture power cranes, shovels and draglines.

Robert M. Bees, a graduate of the University of Iowa, has been named general manager of the new plant.

Paper company integrates multiwall bag division

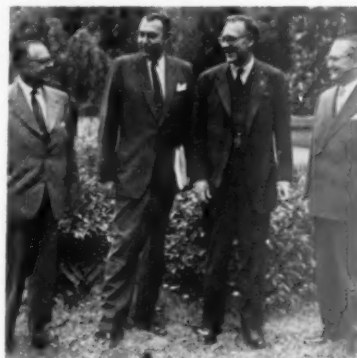
THE ORGANIZATIONAL SETUP of its new multiwall bag division has been announced by West Virginia Pulp and Paper Co., New York, N.Y. Administrative direction of the division, which comprises four multiwall bag plants recently acquired from Fulton Bag and Products Co. and Arkell and Smiths, will be handled from central offices in New York.

Field responsibility for division ac-

tivities will be shared by two regional managers. Sheldon Y. Carnes, formerly vice president of Arkell and Smiths, will be regional manager with headquarters in New York. Jason M. Elsas, formerly president of Fulton Bag and Products Co., will be regional manager with headquarters in New Orleans.

Other executive assignments include Thomas L. Jones of New York and J. Frank Greeley of New Orleans as regional sales managers, and Arnold C. Harmsen and Peter H. Walmsley as regional production managers.

Yale and Towne holds market conference



INTERNATIONAL EXECUTIVES of The Yale & Towne Mfg. Co., New York, N.Y., recently met in Versailles, France, for a three-day business conference. Officials met with economists and government experts to discuss the potential effects the European common market and proposed free trade area will have on the United States' construction equipment industry.

Among those attending the conference were (left to right): H. Gilbert Ramsell, general manager of two British divisions; Robert G. Allan, general manager of the Contractors Machinery Division; William H. Mathers, vice president and secretary who headed the company's American delegation; and Henry D. Rolph, general manager of the German division.

(Continued on page 160)

Elected to ESCO board

ACCORDING TO AN ANNOUNCEMENT by Electric Steel Foundry Co., Portland, Ore., R. W. deWeese, vice president in charge of sales, and Henry T. Swigert recently were elected to the board of directors.

George R. Nielsen dies

GEORGE R. NIELSEN, former vice president of F. L. Smidth & Co., New York, N.Y., passed away May 25, 1958. Mr. Nielsen joined the company in 1907 as an engineer. In 1940 he was elected a vice president, a position he held until his retirement in 1953.

You get extra production, extra value with BUCYRUS-ERIES



POWER flows smoothly from engine to front end, giving you extra muscle where it counts! Clutches and brakes stay even and true because they're self-adjusting for temperature changes during operation.

Weight of all machinery is distributed to give you coordinated dig-swing-dump stability that means fast cycles. Service is easy because every major assembly is readily accessible. Power is transmitted from engine to transmission shaft by a multiple-strand roller chain fully enclosed and running in oil. Routine lubrication is

fast because most fittings are centrally located, easy to reach.

Bucyrus-Eries last longer as proved on thousands of jobs all over the country! They're worth more when you trade, too. Call your nearby distributor today and get details on the size you need to increase pit output . . . make more profit!

552E58



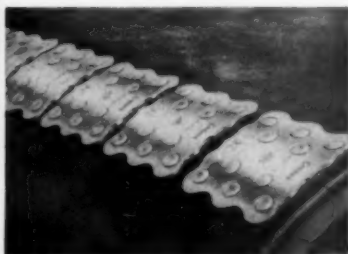
South Milwaukee, Wisconsin

MODERNIZE . . . to economize!



For joining and repairing
Conveyor Belts with
**CRESCENT PLATES
and RIVETS**

**A HAMMER IS
ALL YOU NEED!**



Proof: Crescent Plates and Rivets are as good as new after 18 months at 300 TPH in Limestone Quarry. They last longer than the belt and can be used over and over again.

For particularly abrasive conditions Crescent Countersunk Plates and Countersunk Rivets reduce wear to a MINIMUM.

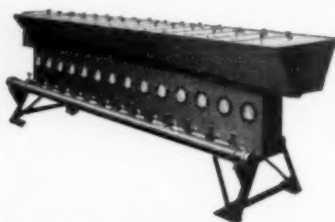
**Order today from your
distributor, or write to**

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The CONCENTCO® CPC Classifier, operating by hydraulic water only and with no moving parts, classifies up to 10 or more sizes accurately and economically . . . as many sizes as there are cells in the Classifier. Classification is continuous and simultaneous. Action is visible so that each cell's water adjustment is easily regulated for sharp sizing. Maintenance cost is exceptionally low. Send for full information.



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Incorporated 1906

The DEISTER CONCENTRATOR COMPANY, INC.

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WHAT ARE YOU PAYING FOR REPAIRS?

The money you are paying to keep worn-out equipment working may be just enough for you to own better equipment.

See the "WHERE TO BUY" Section

MANUFACTURERS NEWS

(Continued from page 158)

**Elect Hyster Co.
vice presidents**



Ronald



Rostedt

RAY M. RONALD AND FRANK A. ROSTEDT have been elected vice presidents of Hyster Co., Portland, Ore., according to an announcement by Ernest G. Swigert, president.

Mr. Ronald, named vice president in charge of the tractor equipment division, has been serving as division manager. A graduate of Oregon State College, he has been with the company since 1930.

Mr. Rostedt, former managing director of Hyster's plant in Nijmegen, The Netherlands, has been named vice president of the international division. He has served as controller and as assistant secretary and treasurer since joining the company in 1938.

**Appoint Napco
marketing director**



ACCORDING TO AN ANNOUNCEMENT by Napco Industries, Inc., Minneapolis, Minn., Paul J. Wolfert has been appointed to the newly created position of marketing director. Mr. Wolfert, formerly general sales manager for the Blaw-Knox Co., Mattoon, Ill., is a member of the Highway Research Board and the ACI.

END

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**LOW COST—DEPENDABLE
INDUSTRIAL RUBBER PRODUCTS**

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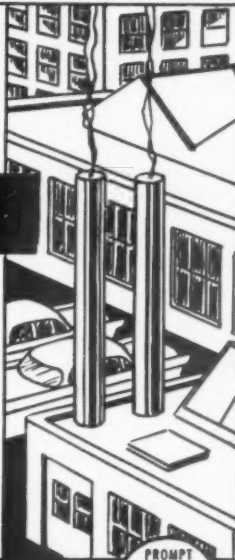
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Conveyor Grader Hot Material V-Belts
Elevator Chute Lining Mucker Transmission

CARLYLE RUBBER CO., INC.

103-107 Warren St., New York 7, N. Y. Dlgby9 3810



PROMPT
SHIPMENTS
LOW COST
QUALITY
PRODUCTS

SPECIALS

6'-5"x100' Kilns
#1 Sturtevant rotary fine crusher

CRUSHERS

1—30" x 36", 24" x 36", 18" x 36", 15" x 30", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls, rebuilt, 36" x 16 rebuilt Sturtevant rolls.
2—24" x 12" Rogers Iron Works Crushing Rolls, Rebuilt.
1—6", 10", 16", 20" McCully Superior Gy-ratory Crushers.
No. 3 up to No. 12 Gytratory Crushers.

BALL & TUBE MILLS

2—5½' x 20', 5' x 22', 6' x 22' & 7' x 24'.

MISCELLANEOUS

Bradley Mills—#1 Raymond Mill.
15 ton hydrated lime plants

We make new dryers and kilns.

*Have you any machinery that you
want to sell?*

W. P. HEINEKEN, INC.

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RAIL**

& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks

L. B. FOSTER CO.

PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
CHICAGO 4 • HOUSTON 2 • LOS ANGELES 5

TELSMITH

3½ft. Cone Crusher in Excellent Condition.
2½ yrs. old. Extra Manganese linings: \$10,750.

Mitchell Distributing Co. Inc.

Spruce Pine, N. C. PO5-4205

OUR 50TH YEAR

Cedar Rapids 25 Yd. Secondary
Portable Crushing Plant.

Acme Jaw Crusher 9" x 16"

Acme Jaw Crusher 14" x 26"

Reliance Jaw Crusher 9" x 16"

New Universal S.D. Screen 3 x 5'

New Universal S.D. Screen 3 x 8'

New Universal S.D. Screen 3½ x 8'

Seco Double Deck Screen 4' x 8'

Revolv. Screen 48" x 20', trunnions.

6" Enclosed Bucket Elevator

8" Enclosed Bucket Elevator

10" x 75' Enclosed Elevator

6" Encl. Perfect Discharge Elevator

Sandvik Steel Conveyor, 30" x 45' with
idlers and pulley.

Trough Idlers, 42" x 48" antifriction

Trough Idlers, 36" x 5 roll type

Trough Idlers, 36" x 3 roll, roller brg.

New Idlers, 18" and 24"

Plain Bearing Trough Idlers, 5 roll type
20" and 24".

20" Roller Bearing Idlers and Belting.

Misc. Size Large Conveyor Pulleys

Eriez Permanent Magnetic Pulley 15 x 16"

Sullivan Elec. Tugger Hoist, 7½ H.P.

Small Gasoline Water Pumps

15 Ton Stiffleg Derrick, 110' boom.

COMPLETE STOCK — ALL SIZES

CHAIN—BELTING—ELEVATOR BUCKETS

IDLERS—PULLEYS—MOTORS—V BELT DRIVES

REDUCERS—GEAR MOTORS

G. A. UNVERZAGT & SONS INC.

136 Coit Street Irvington, N.J.

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MOTORS AND GENERATORS

All sizes, new and rebuilt. Starters, acces-sories, pulleys and repair parts. Gear mo-tors, Falk Shaft mounted Speed Reducers, couplings and V-belt drives.

Expert Repair Service

NUSSBAUM ELECTRIC COMPANY

220 E. Douglas Ave., Fort Wayne, Ind.

TRACTOR-SHOVELS

Caterpillar "D-6" Used Tractor, S/N 9U-5482 (1950 model), w/Trackson Cable-controlled Hi-Lift Front End Loader. Ex-celent shape.

Caterpillar "D-4" Used Tractor, S/N 7U-21979SP, w/Trackson Hyd. Front End Loader. Excellent Condition.

I-H "TD-9" Used Diesel Tractor w/Hough Hydraulic Front End Loader.

I-H "TD18-A" Used Diesel Crawler Tractor (1850), w/Heil Dozer, DDPCU

TRANSIT MIXERS

Rex 3 Yd. Hi-Discharge (4¼ yd. Agitator) mounted on 1950 Model LF172 Tandem Axle Truck.

Jaeger 3 Yd. Hi-Discharge (4¼ yd. Agitator) repaired, blasted & painted. Mounted Chevrolet tandem truck.

Smith 3 Yd. Hi-Discharge (4¼ yd. Agitator) mounted Chevrolet Tandem Axle Truck, low-priced.

CRUSHING EQUIPMENT

Universal "916" R.B. Jaw Crusher*.

Gruendler Port. Pulverizer Plant, 3x8 feed-er, "3xB" Mill, 30" belts, discharge con-veyor, GM "671" diesel power, 1957 model.

Dixie Port. Pulverizing Plant, 3x8 feeder, 3x8 Cedarapids screen, 3006 Dixie mill, 30" Under-discharge conveyor, GM "671" diesel power unit. 6 years old. Completely overhauled.

Wisconsin-Foundry Port. Gravel Plant, feed hopper, 9x35 jaw, 3018 roll, 4x8 2-deck screen, 24" conveyor, less power. Low priced.

Austin-Western Port. Gravel Plant, 1036 RB Jaw, reciprocating feeder, 3x8 2-deck screen, sand reject conveyor, 24" conveyor, steel wheels, D-8800 power unit.

Gruendler Port. Pulverizer Plant w/plate feeder, Simplicity 3x8 screen, Gruendler 24 x 24 mill, Cat D-337 power.

Universal Port. Pulverizer Plant, 2x6 feeder, 3x8 Simplicity screen, Universal No. 4 mill, Cat D-337 power.

Pennsylvania Used 3080 Hammermill, revers-ible, w/multi-speed sheaves & belts. Used very little. Good condition.

NOTE: All This Equipment Located in our Yard except*

120 S. Pierpont

Phone 4-6706

EIGHMY EQUIPMENT COMPANY
ROCKFORD, ILLINOIS

FOR SALE

104" x 70' Ruggles Cole Dryer

9' x 125' x 1½" Rotary Kiln 30 H.P.

502-16 & 705-24 Roto Louvre Dryers

8' x 50' Allis Chalmers Oil Fired 20 H.P. Dryer

6' x 50' Rotary Dryer

5' x 40' x ¾" Rotary Kiln

6' x 30' Rotary Cooler

4' x 20' Ruggles Cole XH2 Dryer

±60 Williams Hammermill

Robinson #13 Saw Tooth 15 HP Crusher

Jeffrey Hammermills, 24"x18"; 20"x12"; 15"x8".

Pennsylvania C-3-30 Hammermill, 60 HP

±6669 Raymond 6 Roll Hi-Side Roller Mill

Raymond 3 Roll High Side Mill with Double

Whizzer, Fan and Dust Collector

18 Bins, 15 to 200 ton

Rotoclone Dust Collector Size 36 Type W

24" x 550' Belt Conveyors (4)

42" x 500' Apron Conveyor, mesh belt

26" x 27' Drag Conveyor 10 H.P.

24" x 10' Pug Mill 30 H.P.

4' x 6' & 4' x 8' Hummer Single Deck Screens

12" Merrick Weightometer Pivoted type

18"x16", 36"x6", 48"x8" Apron Feeders

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**ROCK PRODUCTS DIV. of
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60 East 42nd St., New York 17, N.Y.

WHERE TO BUY

SPECIAL ITEMS

Iowa 53"x60" dbl. impact hammermill
Marinecraft 10" air separator 75 HP elec. motor
Pangborn CII-2, exhaust blower, etc.
Traylor 56"x72" sectional frame jaw crusher
Traylor 4' Model TV crusher. Numerous spare parts.
Symons 4 1/2' cone crusher, std. head coarse bowl
Nordberg Gyradisc 54" 200 HP elec. motor
Bent conveyors 24" 30" 42" var. lgths some w. elec.
tr mag. bd. pulley. A-244 36"x30" 24"x30" 36"x12".

CONCRETE MIXERS

Ransome Model 814, 3 yd. tilting type
Smith 422, 4 yd. tilting type
Koeberling 368 2 yd. tilting type

TRUCKS—TRANSIT MIXERS

15 Ford F-8 9 yd. end dump. Excel. Reinforced, 1955.
10-20 ton Dart, end dump. Sipee, WAK Butane
6 Euclid 36 TD end dumps 300 HP Cummins Diesel
1 int. L-102 Hauler 1000 8 yd. yd. 1000.
6 Smith tan. ax. Diesel, 1953, 5 1/2 yd. mixing
6 Smith tan. ax. 4 1/2 yd. mixing

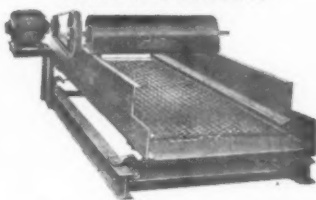
CRUSHERS—KILNS—DRYERS

JAW: Acme 10x20, 18x36, 18x42, 18x48, 18x54, 18x60, 18x66, 18x72, 18x78, 18x84, 18x90, 18x96, 18x102, 18x108, 18x114, 18x120, 18x126, 18x132, 18x138, 18x144, 18x150, 18x156, 18x162, 18x168, 18x174, 18x180, 18x186, 18x192, 18x198, 18x204, 18x210, 18x216, 18x222, 18x228, 18x234, 18x240, 18x246, 18x252, 18x258, 18x264, 18x270, 18x276, 18x282, 18x288, 18x294, 18x300, 18x306, 18x312, 18x318, 18x324, 18x330, 18x336, 18x342, 18x348, 18x354, 18x360, 18x366, 18x372, 18x378, 18x384, 18x390, 18x396, 18x402, 18x408, 18x414, 18x420, 18x426, 18x432, 18x438, 18x444, 18x450, 18x456, 18x462, 18x468, 18x474, 18x480, 18x486, 18x492, 18x498, 18x504, 18x510, 18x516, 18x522, 18x528, 18x534, 18x540, 18x546, 18x552, 18x558, 18x564, 18x570, 18x576, 18x582, 18x588, 18x594, 18x600, 18x606, 18x612, 18x618, 18x624, 18x630, 18x636, 18x642, 18x648, 18x654, 18x660, 18x666, 18x672, 18x678, 18x684, 18x690, 18x696, 18x702, 18x708, 18x714, 18x720, 18x726, 18x732, 18x738, 18x744, 18x750, 18x756, 18x762, 18x768, 18x774, 18x780, 18x786, 18x792, 18x798, 18x804, 18x810, 18x816, 18x822, 18x828, 18x834, 18x840, 18x846, 18x852, 18x858, 18x864, 18x870, 18x876, 18x882, 18x888, 18x894, 18x900, 18x906, 18x912, 18x918, 18x924, 18x930, 18x936, 18x942, 18x948, 18x954, 18x960, 18x966, 18x972, 18x978, 18x984, 18x990, 18x996, 18x1002, 18x1008, 18x1014, 18x1020, 18x1026, 18x1032, 18x1038, 18x1044, 18x1050, 18x1056, 18x1062, 18x1068, 18x1074, 18x1080, 18x1086, 18x1092, 18x1098, 18x1104, 18x1110, 18x1116, 18x1122, 18x1128, 18x1134, 18x1140, 18x1146, 18x1152, 18x1158, 18x1164, 18x1170, 18x1176, 18x1182, 18x1188, 18x1194, 18x1200, 18x1206, 18x1212, 18x1218, 18x1224, 18x1230, 18x1236, 18x1242, 18x1248, 18x1254, 18x1260, 18x1266, 18x1272, 18x1278, 18x1284, 18x1290, 18x1296, 18x1302, 18x1308, 18x1314, 18x1320, 18x1326, 18x1332, 18x1338, 18x1344, 18x1350, 18x1356, 18x1362, 18x1368, 18x1374, 18x1380, 18x1386, 18x1392, 18x1398, 18x1404, 18x1410, 18x1416, 18x1422, 18x1428, 18x1434, 18x1440, 18x1446, 18x1452, 18x1458, 18x1464, 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18x6132, 18x6138, 18x6144, 18x6150, 18x6156, 18x6162, 18x6168, 18x6174, 18x6180, 18x6186, 18x6192, 18x6198, 18x6204, 18x6210, 18x6216, 18x6222, 18x6228, 18x6234, 18x6240, 18x6246, 18x6252, 18x6258, 18x6264, 18x6270, 18x6276, 18x6282, 18x6288, 18x6294, 18x6300, 18x6306, 18x6312, 18x6318, 18x6324, 18x6330, 18x6336, 18x6342, 18x6348, 18x6354, 18x6360, 18x6366, 18x6372, 18x6378, 18x6384, 18x6390, 18x6396, 18x6402, 18x6408, 18x6414, 18x6420, 18x6426, 18x6432, 18x6438, 18x6444, 18x6450, 18x6456, 18x6462, 18x6468, 18x6474, 18x6480, 18x6486, 18x6492, 18x6498, 18x6504, 18x6510, 18x6516, 18x6522, 18x6528, 18x6534, 18x6540, 18x6546, 18x6552, 18x6558, 18x6564, 18x6570, 18x6576, 18x6582, 18x6588, 18x6594, 18x6600, 18x6606, 18x6612, 18x6618, 18x6624, 18x6630, 18x6636, 18x6642, 18x6648, 18x6654, 18x6660, 18x6666, 18x6672, 18x6678, 18x6684, 18x6690, 18x6696, 18x6702, 18x6708, 18x6714, 18x6720, 18x6726, 18x6732, 18x6738, 18x6744, 18x6750, 18x6756, 18x6762, 18x6768, 18x6774, 18x6780, 18x6786, 18x6792, 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18x7464, 18x7470, 18x7476, 18x7482, 18x7488, 18x7494, 18x7500, 18x7506, 18x7512, 18x7518, 18x7524, 18x7530, 18x7536, 18x7542, 18x7548, 18x7554, 18x7560, 18x7566, 18x7572, 18x7578, 18x7584, 18x7590, 18x7596, 18x7602, 18x7608, 18x7614, 18x7620, 18x7626, 18x7632, 18x7638, 18x7644, 18x7650, 18x7656, 18x7662, 18x7668, 18x7674, 18x7680, 18x7686, 18x7692, 18x7698, 18x7704, 18x7710, 18x7716, 18x7722, 18x7728, 18x7734, 18x7740, 18x7746, 18x7752, 18x7758, 18x7764, 18x7770, 18x7776, 18x7782, 18x7788, 18x7794, 18x7800, 18x7806, 18x7812, 18x7818, 18x7824, 18x7830, 18x7836, 18x7842, 18x7848, 18x7854, 18x7860, 18x7866, 18x7872, 18x7878, 18x7884, 18x7890, 18x7896, 18x7902

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NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE A: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. WRITE FOR BULL. #1086.

Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	\$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

NEW BONDED® HEAVY DUTY VIBRATING SCREENS



HEAVY DUTY MODELS, TYPE B: Four bearing positive torque eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. WRITE FOR BULL. #1087.

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	\$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

NEW CONVEYOR BELTING AT NEW LOW PRICES SAVE UP TO 44%

WE PAY FREIGHT ON 200 POUNDS OR OVER



QUALITY TESTED CONVEYOR BELTING®

Major Brand: 12# to 15# Average Friction Pull, 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	\$3.63 ft.	\$2.29 ft.
16"	4	4.08 ft.	2.41 ft.
18"	4	4.51 ft.	2.66 ft.
20"	4	4.97 ft.	3.08 ft.
24"	4	5.85 ft.	3.45 ft.
30"	4	7.18 ft.	4.22 ft.
36"	4	8.51 ft.	5.01 ft.

Major Bee Brand: 16# to 19# Average Friction Pull, 2500# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

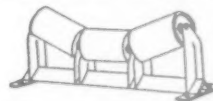
Width	Ply	List Price	Sale Price
14"	4	\$ 4.31 ft.	\$2.48 ft.
16"	4	4.85 ft.	2.80 ft.
18"	4	5.39 ft.	3.10 ft.
20"	4	5.90 ft.	3.54 ft.
24"	4	6.94 ft.	4.00 ft.
30"	4	8.53 ft.	4.92 ft.
36"	4	10.09 ft.	5.95 ft.
24"	5	8.14 ft.	4.68 ft.

*All belting is tested by the Engineering Laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1209

NEW IDLERS AND RETURN ROLLS SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:			
14" belt	\$18.50	24" belt	\$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:			
14" belt	\$7.25	24" belt	\$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. WRITE FOR BULLETIN #1138.

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%



CONVEYOR PRICES INCLUDE BELTING

Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 6" roll diameter idlers and return rolls. 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/4" or 2 3/8" diameter shaft. We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/8" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. WRITE FOR BULLETIN #1138. Bonded troughing idler conveyors also available in Truss Frame Construction. WRITE FOR BULLETIN #1189 AND PRICES.

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Ft.
14"	25'	\$1397	\$ 722	
14"	50'	2222	1144	\$16.84
14"	85'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1068	
16"	60'	2662	1359	18.64
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	
18"	85'	3697	1933	19.24
18"	100'	4252	2220	
18"	180'	5362	2797	
20"	25'	1517	828	
20"	60'	2862	1533	
20"	75'	3467	1838	20.37
20"	90'	4052	2145	
24"	25'	1596	898	
24"	45'	2430	1330	
24"	70'	3480	1875	
24"	100'	4740	2514	21.78
24"	120'	5580	2950	
24"	150'	6840	3603	
30"	50'	2911	1617	
30"	70'	3871	2119	24.75
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	
36"	60'	3638	2096	27.95
36"	100'	5718	3214	

NEW BONDED® FEEDERS



Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers. Priced From \$224.00

Bonded HDF-18 Heavy Duty Feeders were especially designed for abrasive materials such as Ore, Rock, Crushed Stone, Gravel, Sand, Clinkers, Abrasive Volcanic Ash and Rock Abrasion Resistant Alloy Steel Plate is used for all parts that contact the material. Capacities to 440 Tons Per Hour.

HDF Series Plate Feeder - Priced From \$925.00
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Open or Enclosed. Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded's standard models mean lower prices and you get a Custom Built Elevator at no extra cost.

There is a style of bucket for virtually every material or condition: wet or dry, lumpy or fine, granular silvery, or pellet shapes, hot or chemically active. A complete line of Continuous Steel, Salem Steel and Malleable Iron Buckets available in a wide variety of sizes, shapes, gauges and styles at low prices.

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Cedarapids 3042 double impeller. Rebuilt
Cedarapids 2633 Hammermill secondary plant on rubber.
Cedarapids 2033 hammermill. Rebuilt.
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Telamith 12 B gyratory crusher.
Scottsdale model 63 double roll coal crusher.
26" x 84" apron feeder with drive.
Robins 4' x 9' triple deck screen. Reconditioned
Cedarapids 4' x 12' double deck screen. Rebuilt
New Holland 4' x 12' double deck screen. Rebuilt
Pioneer 4' x 8' double deck screen. Rebuilt
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27 1/2 ton, single-compartment 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
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Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belt.

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P&H 655B 1 1/2 yd. diesel dragline.
Lorain L-50K8, 1-yd. diesel backhoe. Excellent.
Lorain L-40, 3/4-yd. diesel crane.
Lorain L-25K, 1-yd. gas clamshell.
Lorain L-41 3/4-yd. diesel backhoe
Lima 34 Paymaster 3/4-yd diesel shovel. Good
Unit 1630 3/4-yd diesel powered shovel-crane
Lorain TL58 3/4-yd gas clam-crane.
Insley K-12, 1/2 yd. gas clam-crane
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Koehring 304 3/4-yd. diesel backhoe
2—Lorain MC-4 20-ton Moto-Cranes
Link Belt HC-90 25-ton truck crane
Lorain MC-504W 25-ton Moto-Crane.
Lorain MC-4 15-ton Moto-Crane.
2—Lorain TL-20 10-ton gas Moto-cranes.
Lorain SP-107, 7-ton self-propelled crane

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2—Euclid T8-18 twin engine scrapers.
4—Euclid 18-yd. overhung engine scrapers.
1—Euclid 18 1/2-yd. site wheel scraper.
1—Euclid TC-12 twin engine tractor.
3—Euclid 22-ton rear dumps. Excellent.
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1—Fullman S-600, 6 to 8 yard scraper.
1—Caterpillar DW-10 scraper.
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1—Euclid tractor with 3200 gallon water tank semitrailer.
1—Caterpillar D-7 with "able bulldozer blade.
1—Caterpillar D-6 with hydraulic angledosier blade.
1—Caterpillar D-4 Tractor only
1—International 380 tractor, with loader back hoe.
1—LaPlante choate 13 1/2-yd. Cable scraper
1—Atco H35, 10 1/2-yd. Hydraulic scraper

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Lorain 820, 2-yd., 23' boom, 21' stick
Lorain 80, 1-yd., 21' boom, 17' stick
Lorain 40, 3/4-yd., 19' boom, 16' stick
Lorain 30A, 1/2-yd., 16' boom, 12 1/4' stick.
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Lorain 40A, 18' boom, 7' stick, 28", 36" or 44" bucket.
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OMC Twin Diesel, rebuilt.
OMC 3021C, 3-cylinder, new.

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105 cu. ft. Ingersoll-Rand gas portable
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CONE, Symons 7' Super Standard
CONE, Symons 3', 75 HP
GYRATORY, Kennedy, 49, 38 1/2, 37 1/2, 19 1/2, 14
JAW, Mitchell, 18" x 9", 25 HP
DOUBLE ROLL, Gruendler, 24" x 24"
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UNUSED Penna. Crusher Swing HAM-
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ies DNC, Traveling Breaker Plate.
Requires 400 HP motor.

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8' x 115' Long—1/2" shell, 2 tires
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Indirect-Direct heat.
7' x 80', Vulcan Stone Dryer.
9' dia. x 30', McDermott, Stainless Lined.
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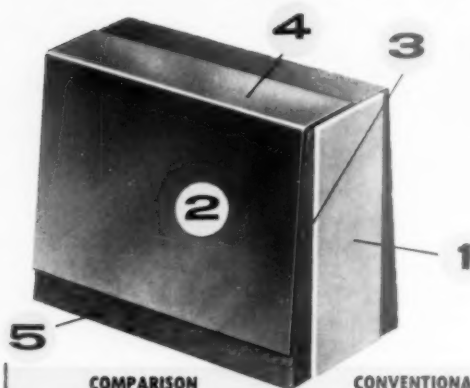
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Steel plates between bricks for bonding	Install by hand	Attached to brick at factory	Bonding shim to liner assures automatic placement of shim
Provision for circumferential expansion	Install cardboard spacers by hand	Expansion provided by thickness of adhesive that bonds shim to brick	Thickness of combustible adhesive provides correct allowance for circumferential expansion (within ring)
Hot face indicator	No hot face indicator	Clearly identified by touch or sight	Plate overlapping hot face makes visual inspection quick—easy to see that each brick is correctly installed
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